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Congressional Committee Makes Awards

Contracts Are Let On 102 Lots Out of Total of 169 On Which Bids Were Called For — Tie Bids Were Received on 25 Lots and These Will Be Further Considered — Some Bids Lost Because of Walsh-Healey Act.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 26, 1937—At a meeting of the Joint Congressional Committee on Printing held on Monday awards were made for a large quantity of paper for use of the Government Printing Office for the six months beginning July 1.

The schedule for which bids were opened on May 17 included 169 items. No bids at all were received on 16 of the items in the schedule and one bid only was received on 26 lots.

Awards were made on low bid lots only on Monday but a further meeting of the committee will be held next week, probably on June 1, when consideration will be given to the items where there were tie bids.

Awards were made on Monday on 102 lots. There were 25 lots on which there were tie bids and it is these that will be given further consideration by the committee. On those items on which no awards are made, the paper will be purchased on the open market.

On certain lots, Nos. 53, 264, 351, and 364, the Mathers-Lamm Company was the low bidder, but the mills for which the company bid would not bid under the Walsh-Healey act and so the next lowest bidder received the award.

On lots Nos. 197 and 362 the Mathers-Lamm Paper Company was the only bidder but these items were also rejected because the company did not guarantee that it would observe the Walsh-Healey act.

On lots Nos. 260, 261, and 280, no award was made because the tonnage on which bids were made was too low.

The awards made on Monday were as follows:

No. 1, no bids received.
No. 3, Perkins-Goodwin Company, 6.51 cents.
No. 10, R. P. Andrews Paper Company, 6.16 cents.
No. 13, Stanford Paper Company, 5.92 cents.
No. 14, no bids received.
No. 15, R. P. Andrews Paper Company, 6.19 cents.
No. 18, no bids received.
No. 19, Whitaker Paper Company, 14.77 cents.
No. 20, Aetna Paper Company, 9.888 cents.
No. 21, Aetna Paper Company, 9.888 cents.
No. 22, Aetna Paper Company, 9.888 cents.
No. 23, Aetna Paper Company, 12.378 cents.
No. 24, Barton, Duer & Koch Paper Company, 16.75 cents.
No. 25, Barton, Duer & Koch Paper Company, 16.75 cents.
No. 26, R. P. Andrews Paper Company, 6.52 cents.
No. 35, R. P. Andrews Paper Company, 7.30 cents.
No. 37, R. P. Andrews Paper Company, 14.997 cents.
No. 40, Aetna Paper Company, 10.988 cents.
No. 43, Barton, Duer & Koch Paper Company, 6.16 cents.
No. 44, Barton, Duer & Koch Paper Company, 7.89 cents.
No. 47, Aetna Paper Company, 8.168 cents.
No. 51, R. P. Andrews Paper Company, 10.42 cents.
No. 52, R. P. Andrews Paper Company, 9.75 cents.
No. 53, R. P. Andrews Paper Company, 12.95 cents.
No. 55, Paper Corporation of U. S., 6.50 cents.
No. 56, Paper Corporation of U. S., 6.20 cents.
No. 57, Barton, Duer & Koch Paper Company, 7.59 cents.
No. 58, Barton, Duer & Koch Paper Company, 6.26 cents.
No. 59, Barton, Duer & Koch Paper Company, 6.26 cents.
No. 60, Aetna Paper Company, 10.00 cents.
No. 61, Stanford Paper Company, 7.17 cents.
No. 63, R. P. Andrews Paper Company, 23.80 cents.
No. 64, no bids received.
No. 65, Barton, Duer & Koch Paper Company, 12.68 cents.

(Continued on page 26)

Superintendents Meet At Appleton, Wis.

L. S. Fitzgerald Discusses Pitch Troubles In Paper Making and Remedies — D. Clark Everest and F. J. Timmerman Speak At Dinner—J. T. Wing Loading Pulpwood for Green Bay—William Aylward Leaves $110,000.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., May 24, 1937—Approximately 150 members attended the one-day spring meeting of the Northwest Division of the American Paper and Pulp Mill Superintendents Association at the Conway hotel at Appleton, Wis., Saturday, May 22. Forty-six women also had registered.

At the morning session, L. E. Fitzgerald of the chemical division of the Hercules Powder Company, Kalamazoo, Mich., spoke on "Pitch Troubles in Papermaking and Possible Remedies." He pointed out that more trouble with pitch is experienced in freshly made pulps than in those which have been lapped and stored for a time.

"The major portion of pitch problems arise in the use of wood pulps, particularly ground wood and sulphite, made from coniferous wood containing a mixture of resins," Mr. Fitzgerald said. "The amount of resin present in ducts and ray cells is depended upon the species and freshness of the wood.

"Aging wood reduces the total amount of resins through oxidation and polymerization of both the natural resin acids and the unsaturated fatty acids. Storage of wood chips for a few weeks is equal, in the elimination of pitch troubles, to aging wood or logs for a period of six months or a year. This is because chips lose moisture quickly and oxidation of the resin takes places more readily."

Many mills have partly solved their pitch problems by using chemicals and so-called pitch cures which are added to the stock in the beater, the speaker explained, but securing a trouble-free pulp is the main answer to pitch problems.

Considerable discussion followed the address.

At noon a stag luncheon was held at Butte des Morts Country Club, followed by golf during the afternoon. The women visitors were entertained at luncheon and bridge at the Riverview Country Club.

The convention closed with a banquet in the evening at which Rudolph W. Meyer, of the Badger Paper Mills, Inc., Peshtigo, chairman of the northwest association, presided. Dr. Otto Kress, technical director of the Institute of Paper Chemistry, was the toastmaster. Mayor John Goodland, Jr., spoke a word of official greeting to the visitors.

There were two principal addresses at the banquet, one by F. J. Timmerman of the Northern Paper Mills, Green Bay, Wis., who is president of the American Paper and Pulp Mill Superintendents Association, and another by D. Clark Everest, vice-president and general manager of the Marathon Paper Mills, Rothschild, Wis., a past president of the American Paper and Pulp Manufacturers Association. Mr. Timmerman spoke on the activities and the coming convention of the national superintendents' association, and expressed his appreciation of the splendid attendance at the divisional meeting. The message of Mr. Everest dealt with the new problems confronting the industry in labor relations, and the general trend towards economic progress and profit in the industry.

Present officers of the division besides Chairman Meyer are: Frank Pilot, Nekoosa-Edwards Paper Company, Nekoosa, Wis., first vice-chairman; S. E. Tomczak, Flambeau Paper Company, Park Falls, Wis., second vice-chairman, and R. L. Murwin, Badger Paper Mills, Inc., Peshtigo, Wis., secretary-treasurer.

P. H. Jones of Appleton, was general chairman of convention arrangements, and was assisted by a committee consisting of Milford Taylor, William J. Plank, Clayton M. Holt, Allen H. Thuerer, J. E. O'Donnell, R. M. Radsch, T. J. McMahon, E. F. Davis, H. S. Johnston and Mrs. William J. Plank.

Loading Pulpwood for Green Bay

J. T. Wing, the only 140-foot schooner on the Great Lakes, is under sail for Neebish Island in the St. Mary's River in Canada to load pulpwood for shipment to Green Bay, Wis., for Wisconsin paper mills. The ship is in charge of George A. Fisher as master and a crew of six, some of whom are young men sailing as apprentice seamen. The vessel formerly was in use for sixteen years on the Atlantic ocean, and was reconditioned in the east and brought to Detroit, Mich. It is owned by J. T. Wing & Co.

William Aylward Estate $110,000

The Estate of William Aylward, principal owner of Aylward Sons Company, prominent foundry and machine concern of Neenah, Wis., amounts to $110,000. Mr. Aylward was well known in the paper industry.

Harrison A. Smith Wed

Harrison A. Smith, of the Wisconsin Container Corporation, Manasha, Wis., and Miss Verona Elsner of Appleton, Wis., were married Saturday, May 22, at the chapel of the Fourth Presbyterian Church, Chicago. Mr. and Mrs. Clarton E. Smith of Neenah, Wis. attended the couple. Upon their return from a honeymoon trip, Mr. and Mrs. Smith will reside at 353 Cleveland St., Menasha, Wis.

Heads United Wall Paper

Directors of the United Wall Paper Factories, Inc., have elected Charles W. Kellogg of Hudson Falls, N. Y., president of the company to succeed Hador Ortman, whose resignation was accepted at the meeting. Mr. Kellogg has been chairman of the board. Mr. Ortman plans to enter the management engineering field.

Mr. Kellogg has been with the company since its organization in 1927. Previously he had been treasurer of one of the constituent companies, the Standard Wall Paper Company, with which he had been associated since 1897.

Illinois May Pass Bill Affecting Paper

If Enacted Proposed Measure Might Nullify Previous Victories—Chicago Paper Business Slows Up — Michigan United Paper Co. Moves Chicago Office — Ackerman Paper Mills Coating Plant Employs New Process.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., May 24, 1937—The Illinois legislature is seriously considering a bill, backed by the Department of Finance, which, if passed, might have immediate and far reaching effects on the paper and allied industries. If enacted the proposed bill, S. B. 427, might nullify previous victories of the paper industries with respect to the taxation of tangible property under the Retailers Occupation Tax.

The Act is "in relation to a tax upon persons engaged in the business of producing for others tangible personal property having use or value, in its completed form, only to the person ordering or receiving such property." Known as the Producers' Occupation Tax Act, the legislation is specifically directed at those occupations which have, through court order, received immunity from the provisions of the parent Act because of the nature of their services.

At the present time, the Illinois paper trade, the graphic arts industries and others are carefully estimating the full effects of the words reading "imposed upon persons engaged in the business of producing for others tangible personal property having use or value, in its completed form, only to the persons ordering or receiving such property."

The bill has been favorably reported out of the Senate Committee on Revenue and action is expected upon it at the sessions of next week. Senator James Monroe, Collinsville, introduced the Act and the tax imposed is 3 per cent, the same as that provided under the Retailers Occupation tax. The Senate is also considering S. B. 426, a "use tax" designed to protect Illinois business against evasion of tax payment by those who buy out of the State or have merchandise shipped into the State.

Michigan United Moves Office

The Michigan United Paper Company announces the removal of its Chicago office from 453 West Erie street to 176 West Adams street—Telephone Central 8890; also the consolidation of this office with its Cleveland office.

Illinois, Indiana, Kentucky, Ohio, Western New York, and Western Pennsylvania will be handled from this office and R. E. Gerrish formerly at the Cleveland office will be in charge of this new office.

Chicago Business Lags

Business in the Chicago area has slowed up slightly during the past two weeks, the seasonal decline being less marked than in previous years. Continued slackening is expected for the balance of the month and the early summer season with a marked upturn looked forward to for the Fall. On the average conditions remain decidedly satisfactory. No markets can be characterized as weak although all have lagged off on about the same basis. Blottings are reported as the most noticeably weak of the grades but this condition has applied for some length of time. Book papers are characteristically in demand while krafts continue to reflect the shortage in raw materials. Sulphites are not quite as strong but remain satisfactory with orders still two and three weeks back. Groundwoods remain about the same as last week with the market reported as "satisfactory." Interesting comments on the future of the newsprint market are plentiful with the feeling prevalent that 1938 will show a decided upward trend in this grade.

Divide Bowling Honors

The termination of the current bowling season which found Chicago paper jobbers competing more fiercely than ever before, finds the Bradner Smith & Co. No. 1 team as champions of the Paper Merchants Bowling League. The J. W. Butler No. 1 team was in second place with the Parker, Thomas & Tucker team ranking third. Other teams in the competition were Bermingham & Prosser, Whitaker Paper Company; Moser Paper Company; Blunden-Lyon Company; two teams representing the Chicago Paper Company and No. 2 teams representing Bradner Smith and J. W. Butler. The League held its annual election early in the month with Leonard Litewski of J. W. Butler Paper Company elected president and Norman Ross of Whitaker Paper Company, vice-president. Fred Koch, Bradner Smith & Co. was elected treasurer and G. C. Olson, Chicago Paper Company, secretary.

Salesmen Open Golf Season

Ralph Burnett, chairman of the golf activities of the Midwest Division, Salesmen's Association of the Paper Industry, succeeded in rounding up over sixty members and guests to participate in the initial golf outing of the season held at the Sunset Ridge Country Club on Friday, May 21. The afternoon golf outing was followed by the dinner and song fest lead by the capable Jim Coy. Mr. Coy, we also understand, was a member of the high gross foursome which got the first foursome "booby" prize. W. T. "Bill" Tilden succeeded in capturing low gross honors.

Prepares New Lecture

According to local reports, the printing and allied industries in the Chicago area are soon to have the opportuntiy to listen to a new series of lectures devised and given by C. H. "Doc" Runyan of Bradner, Smith & Co., Chicago paper merchants. Mr. Runyan, widely known for his presentations of paper problems in their relation to the printing trades, is reported to be preparing a series of lectures using charts to illustrate "Possibilities of Limitations of Paper Surfaces."

Ackerman Paper Mills New Process

The G. A. Ackerman Printing Company, Chicago, is reported to have perfected and patented a process by which glossy effects are produced wherever the printing inks cover the special coated paper used in the process, while the paper retains the natural dull finish surface. The paper is prepared at the coating mill operated by the G. A. Ackerman Paper Mills.

Boston Paper Trade Association to Convene

June Meeting and Outing of Association to be Held at Newton Centre, Mass., June 7 — Demand for Paper Less Active With Few Exceptions — Carter, Rice & Co., Corporation Leases New Quarters In Summer Street.

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., May 24, 1937—The regular June meeting and outing of the Boston Paper Trade Association are to be held at the Charles River Country Club, Newton Centre, Mass., Monday, June 7. Three applications for regular membership and three for "limited" will be voted on.

The outdoor sports will start at 2 o'clock, continuing throughout the afternoon. Prizes for first and second place will be awarded in the following events: Horseshoes, with Royal P. Teele in charge; putting, William C. Ross; bowling, Ernest S. Reid, and ball game, W. Gardner Very. The outdoor sports committee is composed of these men, with Mr. Very as chairman.

The putting contest is open to all. Golfers (any contestants who have played on the regular course during the day) entering the putting contest will be handicapped four strokes. The outdoor sports committee have provided a guest prize to be awarded to the first guest winning any one of the three events—horseshoes, putting or bowling. If no guest qualifies to receive a prize it will be awarded as a third prize in the horseshoe pitching contest.

The golf tournament starts at 8:30 a. m. to 2 p. m., with the committee composed of W. J. McLellan, chairman, E. D. Bement, Nelson Feeley, Bruce Crane, W. Edwin Porter, Jr., and John R. Whitney. The tournament includes 18 holes, handicap medal play; four-ball only, and medal play. There will also be a kicker's handicap, a special event to be announced on the bulletin board, and guests' handicap tournament.

Prizes will be awarded in Class A handicap 20 and under for first gross, first net (Challenge Cup), second net, third net; Class B handicap 21 to 28, for first gross, first net, second net, third net; Class C handicap, 28 and over, for best selected nine holes. Class B can play for the championship cup by relinquishing their handicap and accepting 20 rating.

Under first net, Class A, this is the 16th year's play for the handsome silver Golf Championship Cup offered by the Boston Paper Trade Association. It must be won three times to become the permanent property of the winner. Meanwhile it will remain in the custody of the winner of the best net score each year until the succeeding year's play and until such time as someone shall have won it three times. Provided two or more tie for the Challenge Cup, the method of play-off will be determined by the golf committee. No player in handicap competition shall receive more than one prize.

Winners of the Association Championship Cup (a number having already won it twice) are Charles A. Esty, William Stetson, Jr., Asaph Churchill, John Munro, E. Lindsey Cummings, Edward Bement, William Stetson, Jr., Norman Harrower, Roger B. Taft, W. Edwin Porter, Jr., John R. Whitney, W. H. Anders. John Munro, John R. Whitney and W. Edwin Porter, Jr.

A prize will be awarded to the best net in the guests' handicap tournament.

A regular buffet luncheon will be served at the locker building from 11:30 a. m. on. Dinner will be served at 6:45 p. m., after which the prizes will be awarded. The facilities of the club will be at the disposal of the members of the association and their guests all day.

Officers of the Association are F. Bendel Tracy, president; Walter J. Raybold, first vice-president; John L. Hobson, second vice-president; T. Charles Casey, treasurer; John H. Brewer, secretary.

Paper Demand Less Active

The demand for paper was less active, with a few exceptions, in this market during the week under review. In some quarters, the call for fine paper was reported as fairly good, but in general the demand "slowed up." Orders for diploma papers came in in large volume. There was less activity in the wrapping paper division, although the market for this commodity continued firm. Box board was rather quiet.

Business in paper stock was hardly better than fair, but there were few price changes. It is felt that a drop in old papers is in the offing, but values remained unaltered for the week. Bagging and new domestic rags continued firm, but in old domestic rags, roofing stock declined $2.00 a ton. The No. 1 grade went down to 1.35 @ 1.45 from 1.45 @ 1.55 per hundred-weight, No. 2 to 1.35 @ 1.40, and No. 3 to 1.05 @ 1.15 from 1.15 @ 1.25, f. o. b., Boston. Foreign rags continued in the same somewhat improved condition, with dark cottons at 1.90 @ 2.00, f. o. b., Boston.

Carter, Rice & Co. Corp. New Quarters

Carter, Rice & Co., Corp. has leased for a term of years new quarters for its Boston business in the seven story building owned by the Boston Wharf Company and located at 273 Summer street. It will occupy the premises after suitable alterations have been made before the year-end.

The new Summer street location is three minutes' walk from the South Station and is easily accessible for customers and employees. It possesses excellent shipping facilities both for incoming and outgoing merchandise. There is also a large private area in the rear which will provide parking space for customers' use.

Cost Finding Committee Meets

A very constructive luncheon meeting of the Cost Finding Committee of wrapping paper merchants of Greater Boston was held Friday at the Boston Chamber of Commerce at which current market conditions and probable mill conditions were discussed.

Fine Paper Division Plans Luncheon

A luncheon meeting of the Fine Paper Division of the New England Paper Merchants Association is to be held Tuesday at the Boston Chamber of Commerce.

Newsprint Mills Interested in Lower Costs

Saguenay Power Co. Installs Twelfth Unit — Newsprint and Lumber Firms Get Benefit in Chicoutimi—Price of Canadian Newsprint Increased in Argentina and Brazil -- Donnacona Paper Co. Gets Hearst Contract.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., May 24, 1937—With all newsprint plants in this province running at the limit of effective capacity, more and more attention is being devoted to increasing productive power and to lowering costs. The latter is a serious factor, as rising wages and rising prices of all supplies largely offset the increased price of newsprint.

In connection with the lowering of costs an announcement by the Saguenay Power Company is important. This company has made arrangements to install its twelfth 45,000 h.p. generating unit, which is expected to be in operation by September. It will bring the installed capacity to 540,000 h.p., making it one of the largest single hydro-electric stations in North America. The purpose of the new installation is to make possible a better control of system frequency and to generate surplus power for use in electric boilers, thus reducing the necessity for importing coal.

The harnessing of the power of the Saguenay River was undertaken in 1923 after years of study and preparation. The result of the development was the establishment of Price Brothers & Co. Limited's large newsprint mill at River Bend, the Aluminum Company of Canada Limited's smelting plant at Arvida, the Consolidated Paper Corporation's newsprint mill at Port Alfred, Lake St. John Power and Paper Company's newsprint mill at Dolbeau, and the Shawinigan Water and Power Company's transmission line to Quebec City to supply the Anglo-Canadian paper mill. It is expected that water storage developments on the rivers which supply the plant may, in the future, be used to convert surplus power into firm power and attract new industries to join the group which has already been brought to the Saguenay.

Developments at Chicoutimi

Co-incident with the announcement of the new installation by the Saguenay Power Company comes the news that the Quebec Legislature has passed a bill granting benefits to the newsprint and lumber industry in the Chicoutimi region on the Saguenay River. The reason for this bill is that certain mills had been closed in Chicoutimi, one of the various causes being lack of sufficient timber limits. The bill enacts that the Lieutenant-Governor-in-Council (which means the Government) may:

a—Cede, by mutual agreement, upon the conditions he may determine, timber limit concessions, which would assist in the reopening of the pulp and paper mills of the Chicoutimi region, and which may be necessary to assure the maintenance of operations;

b—Exchange lands held under letters patent or licenses to cut timber, for public land, the matter and the conditions of the holding whereof he may determine;

c—Authorize the Minister of Lands and Forests to expropriate such lands when he deems the holding thereof is of a nature to hinder the reopening of such mills or their maintenance in operation, and when it is impossible to obtain voluntary cession or exchange;

d—Amend, respecting timber limit concessions ceded to the owners of such mills under this Act, and those they may already possess, the regulations concerning the granting of licenses to cut timber, the cutting of timber, the transfers of limits, the ground rents, the tax for forest protection, and the regulations concerning, in general, the holding of lands coming from the public domain and the exploitation of the timber on such lands;

e—Compromise with such owners respecting any tax, duty or other claim due to the Crown;

f—Undertake the construction or the remaking of roads or bridges whenever deemed necessary for the putting into, and proper operation of such mills;

g—Make for the aforesaid purposes the necessary expenditure.

Raise Newsprint Price in South America

Announcement has been made here that the selling price of Canadian newsprint in Argentina and Brazil will be increased from £10 10s 0d per metric ton delivered, to £13 15s 0d, the change to be effective as from September 1, 1937, and this will be the price for the period September 1, 1937 to June 30, 1938. A year ago, the price was £9 10s 0d. Some 75,000 tons of newsprint is exported annually to these countries by Canadian producers, including chiefly Price Brothers, Consolidated, International and St. Lawrence Paper.

(A metric ton is 2,206 pounds, so that conversion of each side to dollars and short tons, taking sterling at $5.00, would indicate a price of about $60.00 per short ton in the South American market.

Donnacona Secures Hearst Contract

R. P. Kiernan, president of the Donnacona Paper Company, of Donnacona, Que., announces that the company has entered into a new contract with the Hearst interests, replacing one signed last October, which will run for a term of 5½ years and calls for delivery of 40,000 tons per annum at a contract price in line with the market average. The former contract was for 25,000 tons annually.

Newsprint Large Factor in Exports

How important newsprint is to the export trade of Canada is shown by an analysis of Canada's exports for the month of April. This shows that of the total exports of the Dominion for that month of $32,511,000, no less than one-fourth was represented by paper (chiefly newsprint), which had a value of $8,180,000. In addition, other forest products accounted for $4,386,000, making a total of $12,566,000. Of this wood pulp accounted for $2,424,000, planks and boards for $1,137,000, shingles for $345,000, pulpwood for $166,000, and square timber for $1,000.

C. A. Spaulding Speaks at Philadelphia

Assistant Secretary of the National Paper Trade Association Addresses Paper and Cordage Association of Philadelpia — Says Purpose of Association Is Not To Fix Prices But To Promote Best Interest of Trade.

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., May 24, 1937—At the regular monthly luncheon meeting of the Paper and Cordage Association, held in the Rose Room of the Adelphia Hotel on Friday last, the guest speaker was Chester A. Spaulding, assistant secretary of the National Paper Trade Association.

President E. K. Lay presided, and in introducing Mr. Spaulding, said that he was a practical man and the head of a large paper distributing firm, and the message he had for those present would be from the practical angle.

"Love Your Enemy"

Mr. Spaulding, by reason of sitting next to Rev. Croswell McBee, Chaplain of the Association, said that he was moved to base his talk on a verse from the Bible which says: "Love Your Enemy." In part, Mr. Spaulding said: "The old concept in business was just that . . . 'Love Your Enemy.' In the first place, it is good business and in the second place, a good deal more fun. After all, the vast majority of us who are in business—one way or the other—once we get the meager needs of a roof over our heads and sustenance, there remains the other things—the intangibles. Life, aside from a few paltry dollars, means a great deal to us—the friendship and good will that comes out of our contacts are priceless.

"Personally, I am an optimist, so much so that some of my friends think I go too far. Theodore Roosevelt once said—'Every man owes an obligation to make a contribution for betterment of his own profession.' More and more in our present day business, men are coming to realize that the business in which they operate deserves some contribution from them to make better business. I was much interested by the remarks of Mr. Stevenson of Stevenson, Jordan & Harrison, at the recent convention of the National Paper Trade Association in New York. Mr. Stevenson has been in business for many years, being an engineer and also prominently identified with trade association work. How many times, organizations, business organizations—trade associations, are accused not only by outsiders but by some people coming into them, and men that know better of being price-fixing organizations. It is the concept of many that in organizing groups the motive is how they can fix prices or raise prices.

No Mention of Price-Fixing

"There is nothing set forth in the constitution of our organization which relates to price-fixing. The purpose of our organization is to promote the best interests and welfare of the entire trade. Out of that flows the various protective measures. We have, continually to be on guard against certain tendencies, but price-fixing is not part of the organization.

"It is quite natural in trade associations, as is the case with your group, to bring together competing factors—buyer and seller, in order to talk about your problems and have better understanding, out of which comes eventually a broader concept of the problems that affect each and everyone, and in most instances brings about greater stability of price and excellent team work in connection with it. Your competitors are the best people with whom you can interchange information. The fundamental concept of our organization is to pool our interests and promote educational work for the betterment of trade practices.

"I have heard a lot about your association, and I want to take this opportunity of congratulating you on the splendid record which your association has. I want to suggest to you that as you go about and talk with other people, that you talk about this organization and that you constantly keep in mind the fact that you are a part of the structure, ever mindful that you are promoting the thing you value most in life—the intangibles—good will and better understanding between your competitor and source of supply.

More Cost-Mindedness

"In the days of NRA, it was not uncommon to have people in the trade say—'My business is different from my competitors, I do not have the same overhead as he has.' We found that a great many were not cost-minded and there was, as is the case now, a great deal of guesswork about what it costs to sell orders of various sizes. I think you will agree with me that in the paper and twine business, most executives come into the ranks from the sales force and other departments. Many of you are members of our organization and know some of the educational activities we have been engaged in. We have probably done more than any other wholesale trade organization in the past thirty-five years to learn more about details of our own particular business through cost accounting and standardization. Among the many types of work which we are attempting to do in order to compile authorative data is to list where a manufacturer distributes to wholesale, consumer and chain stores. This information has been very helpful where it has been used both by manufacturers and merchants."

F. S. A. Cherrie With Price & Pierce

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., May 21, 1937—Fred S. A. Cherrie, who represented Castle & Overton in the middle west for thirty years and since April 1 of this year has covered Wisconsin and Minnesota for Price & Pierce, has taken full charge of the Kalamazoo office of the latter named company. In addition to Minnesota and Wisconsin he will represent them in Michigan, Indiana, Illinois and the Miami Valley.

—you'll find it makes a whale of a difference
in **production**
in **finish**
in **operating economy**

That's what Vickery Felt Conditioners are for—to keep your felts uniformly clean and open right through the week, *every week*. . . . May we show you what that means to you?

BIRD MACHINE COMPANY · SOUTH WALPOLE, MASSACHUSETTS

VICKERY FELT CONDITIONER

YOU CAN MAKE MORE MONEY WITH NEW BIRD MACHINERY

Cleaning and Conditioning of Felts*

By David Blanchard[1]

The subject of this article is probably more or less of a bromide to you gentlemen, as almost every day someone appears with a so-called felt cleaner. During the earlier years, when all machines operated at relatively low speed, and there was consequently much less strain on the felts, a bucket of soda ash solution, or one made up with a washing powder containing mostly alkali, would be the usual dose for a loaded felt. Where the strain was less, the weakness caused by alkaline embrittlement of the wool fibers was not so readily noticeable.

Situation Now Markedly Different

The situation today, however, is markedly different. To keep pace with the competition, practically all old machines have been speeded up, while new ones have been designed to operate at hitherto unheard of speeds.

The felt manufacturers have responded nobly, and have improved their products to meet the changed conditions. However, the raw material they all have to work with is still wool (not steel wool), and the fiber-weakening treatment that did not show up so much under the old operating conditions is now causing many a headache for both paper and felt manufacturers.

At the national association meeting held at Richmond, Va. in June 1935, one of my associates, Dr. R. W. Mitchell, technical director of our company, presented a paper that so completely covered the subject of felt cleaning and conditioning, that today very little can be added to it. The tables which it contains, showing the comparison between the pH values of the different simple alkalis often used for felt washing at various concentrations are of particular interest, and a number of reprints have been requested.

Our experiences during the last few years have confirmed our previously expressed opinions that it is impossible to prescribe one material as a sure cure for all conditions.

For the general run of felt cleaning, a material of extremely fast wetting and penetrative power, combined with low alkalinity, similar to our Feltex is indicated. It has the great advantage of not forming any insoluble soaps in conjunction with lime, alum or similar materials which might be present in either the water or the loading, and which do react and cause waterproofing of the felt.

In cases where it is desired to shower the felt while the machine is running paper, a material of similar characteristics but absolutely neutral, similar to our Magnus NX, should be used. It does not adversely affect the stock, cause discoloration, or affect other colors.

Where Old Style Still Shows Advantage

There are still a few conditions where the old style alkaline, soap-type cleaners show an advantage. These are particularly evident where the felt becomes impregnated with certain color pigments, and where small lots of specialties are being run and color changes are frequent. For this purpose we have worked out a special material, the soap content of which is of the low-titre type, which rinses out freely with even the coldest of water.

With the above three materials we have successfully met 99 per cent of the problems submitted to us, while on the other 1 per cent we have made up special materials to meet unusual conditions wherever we have been given the opportunity.

One of the more interesting developments in the past year has been in the improved methods of applying cleaning solutions to felts. Where a few years ago it was common practice to mix the cleaning solution in a barrel alongside the machine just before using, and then throw this solution by the bucketful onto the felt, (and also into the pit), many mills now have tanks holding up to 500 gallons placed in an elevated position, sometimes on an upper floor, and piped down to a shower running across the felt in front of the nip, with a shut-off valve at the side of the machine.

Advantages Outside of Economy

This system has several advantages outside of the very real one of economy. Any cleaning solution is improved by aging. A solution mixed two to twenty-four hours before being used will always do a better job than one freshly mixed. The felt saturation will always be uniform. This is particularly important when shrinking-on new cloth. A new felt that is wet-out with a proper agent before turning on the water showers will be turning out normal production many times sooner than if shrunk-on with just plain water; in spite of the fact that some felt manufacturers now impregnate their felts with a wetting agent before shipping. However, the setup should never be used in conjuction with the ordinary run of soap powders as their soap content is of the high titre type, solutions of which will harden or jell-up (on cooling) in concentrations as low as 1 per cent, with consequent plugging of pipes and showers.

In one section of Dr. Mitchell's paper, he mentions where one of our clients used a similar setup to the one mentioned above to spray a solution onto the felt of a board machine while in operation. This method has since been so widely adopted that some operators of Fourdinier machines have tried similar experiments. The most interesting of these was shown me at one New England mill where they were running a solution of one of our neutral cleaning agents from a pressure tank through their Vickery conditioner. A feed control valve proportions the amount of solution. The equipment and connections are simple to make. By introducing a solution of cleaner at periodic intervals, the water removing efficiency of the felt can be kept at the peak throughout its entire life.

Wide Use for Magnusol

During the last two years paper mills have found a wide use for one of our materials that was originally perfected for the automotive trade. I refer to Magnusol. This is a peculiar form of neutral soap that is soluble in both oil and water. When mixed with kerosene or any cheap, light fuel oil in the pro-

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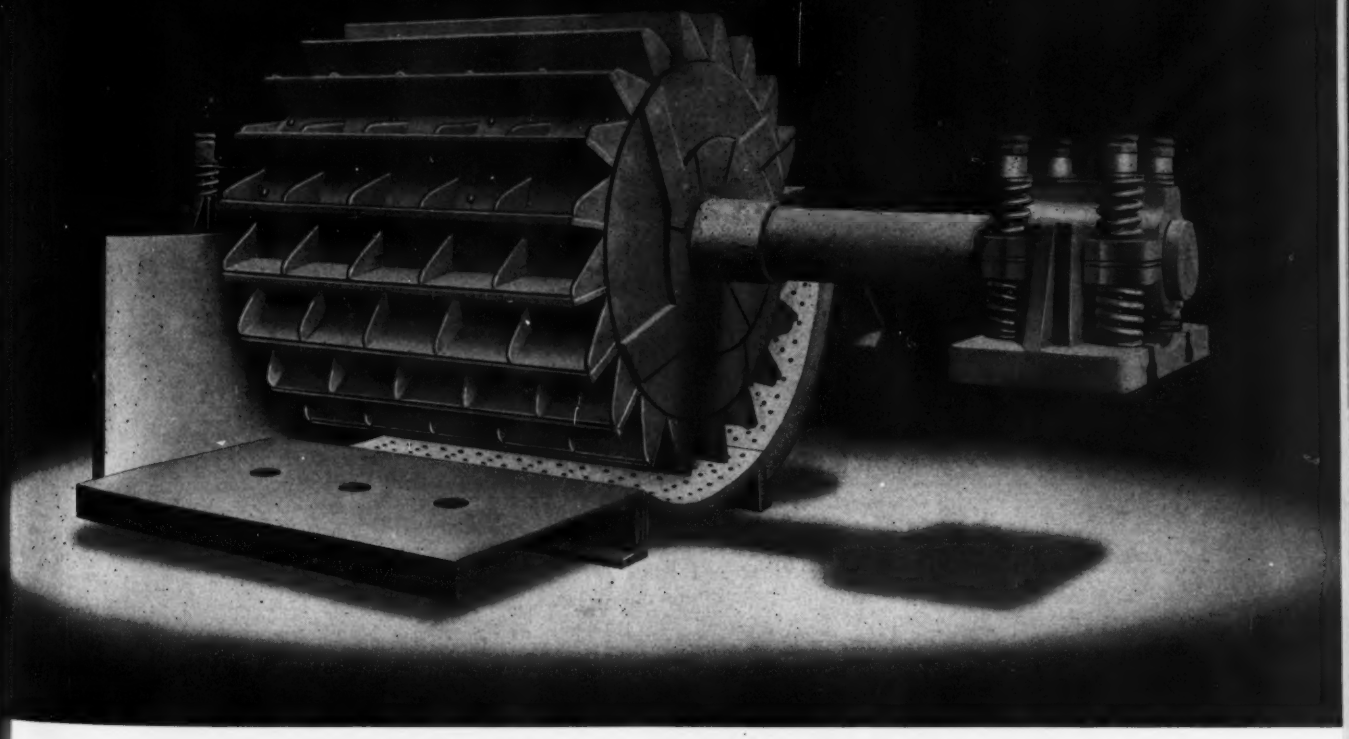
* Presented at the meeting of the New Jersey-Pennsylvania Division of the American Pulp and Paper Mill Superintendents Association, Atlantic City, N. J., May 1, 1937.

[1] Vice-president, Magnus Chemical Co., Garwood, N. J.

Dilts



- **BREAKER BEATERS**—built by Dilts for all types of breaker service—continuous or batch—rugged construction throughout. High performance—low power.
- **BRACED BAR ROLL**—the heart of the breaker beater—the roll—the exclusive all steel braced bar bandless type roll—the strongest construction available anywhere—supported in double suspension spring bearings.
- **BREAKER SYSTEMS**—Cowles Classifiner—settling trough—thickeners—modern stock chests, propeller agitated—Hydrafiners—complete modern stock preparation systems.
- **ABLY ENGINEERED**—for individual requirements. Write for details.

DILTS MACHINE WORKS INC., FULTON, N. Y.

portion of one part Magnusol to six parts oil, by volume, it forms a solvent for all kinds of greases and oils, which are in turn made soluble in water. One of our clients having twelve Fourdrinier machines put on a program of painting all of their machines a light gray. They used Magnusol to put the surface in condition to receive the paint, for which it worked like a charm. However, after applying the light colored paint in place of their former dark maroon, their found that when they tried to keep it clean by the old method of wiping with a kerosene cloth or waste, the surface was left with a smear. I suggested that as the Magnusol solution was harmless to paint, they continue to use it. They have two of our Magnusol sprayers in each machine room—one with the regular 1-6 solution in it; the other with plain water. The tender sprays the frames, steps, etc., with the Magnusol solution for a distance of ten feet or so, and then goes back over it with the water sprayer. At the back of the machine it is now possible to keep hitherto almost inaccessible places behind gears, etc., clean and grease free. The superintendent of another mill tells me that they are able to clean out a whole set of frictions in less time than it formerly required to clean one by their old method. It removes oil and grease from the facings, without any effect on the facing material or metals. I asked this superintendent if this was a material that would normally come under the superintendent or the master mechanic. His reply was that the cleaning before painting was up to the master mechanic but after that it was all up to him. As previously stated, this material was perfected with an altogether different end in view, which had nothing to do with paper mills, but the need has been such that in every mill where it has been tried out, they have become steady, repeating customers. We have had made up a rugged, substantial sprayer for applying Magnusol solution, equipped with oil-proof hose and washers to withstand the action of the kerosene, which we market at virtual cost, to promote the better use of our product.

Suction Press Roll Cleaner

In addition to our slime remover, which has been covered in previous papers on the subject of slime control, and which is now an almost standard material for this work, we have, within the last year, brought out our Magnus Suction Press Roll Cleaner. A full description of this material and of its proper application has been covered in another paper, of which I also have a few reprints. Magnus Suction Press Roll Cleaning is an alkaline penetrating and dispersing agent, which has proven very effective in dissolving the bond between the particles of size, slime, etc., without either the rubber, or the inner shell and mechanical parts being adversely affected. With the suction press, a device of such proven efficiency, and much of that efficiency depending on the holes being fully clean and open, we know that our sales on this particular item will soon reach a volume comparable with Feltex, Slime Remover, and Magnusol.

Michigan Superintendents Meet

KALAMAZOO, Mich., May 20, 1937—The last meeting of the fiscal year for the Michigan Division of The Pulp and Paper Mill Superintendents Association was held at the Park American Hotel, Thursday evening, May 20, 1937, at 7 p. m. It was a dinner meeting and thirty were present.

Chairman Otto F. Fischer, president, introduced C. E. "Bud" Mueller of the Hercules Powder Company as the speaker. His subject was "Factors Effecting the Sizing of Paper and Board." Mr. Mueller has made an exhaustive study of this subject for his company and is recognized as an authority on this branch of the industry. His was not a prepared address but was an account of his varied experiences and tests made in different mills in which he had succeeded in solving sizing problems. It was a very interesting and instructive talk and at the close he answered a number of questions on sizing troubles and was given a rising vote of thanks from those present.

A nominating committee composed of Messrs. Zellers, Barton, La Liberte and Jim Wise was appointed by Chairman Fischer to prepare a slate of new officers for the ensuing year. Roy Zellers spoke briefly of the proceedings of the National Executive Board meeting which he had recently attended. Among those present at the meeting were: O. F. Fischer, Wayne E. Crotty, L. A. Willoughby, Bryant Paper Company; Paul Dumas, Chromium Corporation; A. G. Rosner, Continental Diamond Fibre Company; F. L. Zellers, French Paper Company; Carl C. Schneider, Homer E. Stafford, Hawthorne Paper Company; C. E. Mueller, Hercules Powder Company; Mike Redmond, Kalamazoo Paper Company; L. H. LaLiberte, R. B. Stewart, Kalamazoo Vegetable Parchment Company; W. H. Astle, R. L. Barton, A. E. Hays, M. S. Fogerty, Michigan Paper Company; R. W. Van Kirk, Penick and Ford Company; George A. Thompson, Jr., B. F. Perkins Company; Harry C. Pearson, Pioneer Paper Stock Company; Harry C. Bradford, Rex Paper Company; Henry Bert, Shuler and Benninghofen Company; A. L. Sherwood, A. Weller, Sutherland Company; H. S. Faram, Elbert G. Milham, Watervliet Paper Company; H. B. Johnston, C. "Baldy" Smith.

New England Paper Outing

SPRINGFIELD, Mass., May 24, 1937—With more than forty present, including officers of the National Paper Trade Association's guests, the annual business meeting and outing of the New England Paper Merchants Association, held Tuesday at the Longmeadow Country Club here, was a highly successful affair.

At the business meeting, with President Frank H. Winter presiding, a resolution to be sent to the New England members of Congress, endorsing their efforts to restore the independence of the legislative branch of Congress and their efforts to balance the budget was adopted. A proposal for cooperative buying of iron truck tires for members only was discussed.

In the afternoon, there were sports, including golf, horseshoe pitching and bowling, with prizes for the winners.

Among those present were F. Bendel Tracy, president of the National Paper Trade Association; Arthur H. Chamberlain, secretary; O. F. Marquardt, last year's president of the National Association, John C. Hurd, secretary of the New England group, and paper mill executives from various parts of New England.

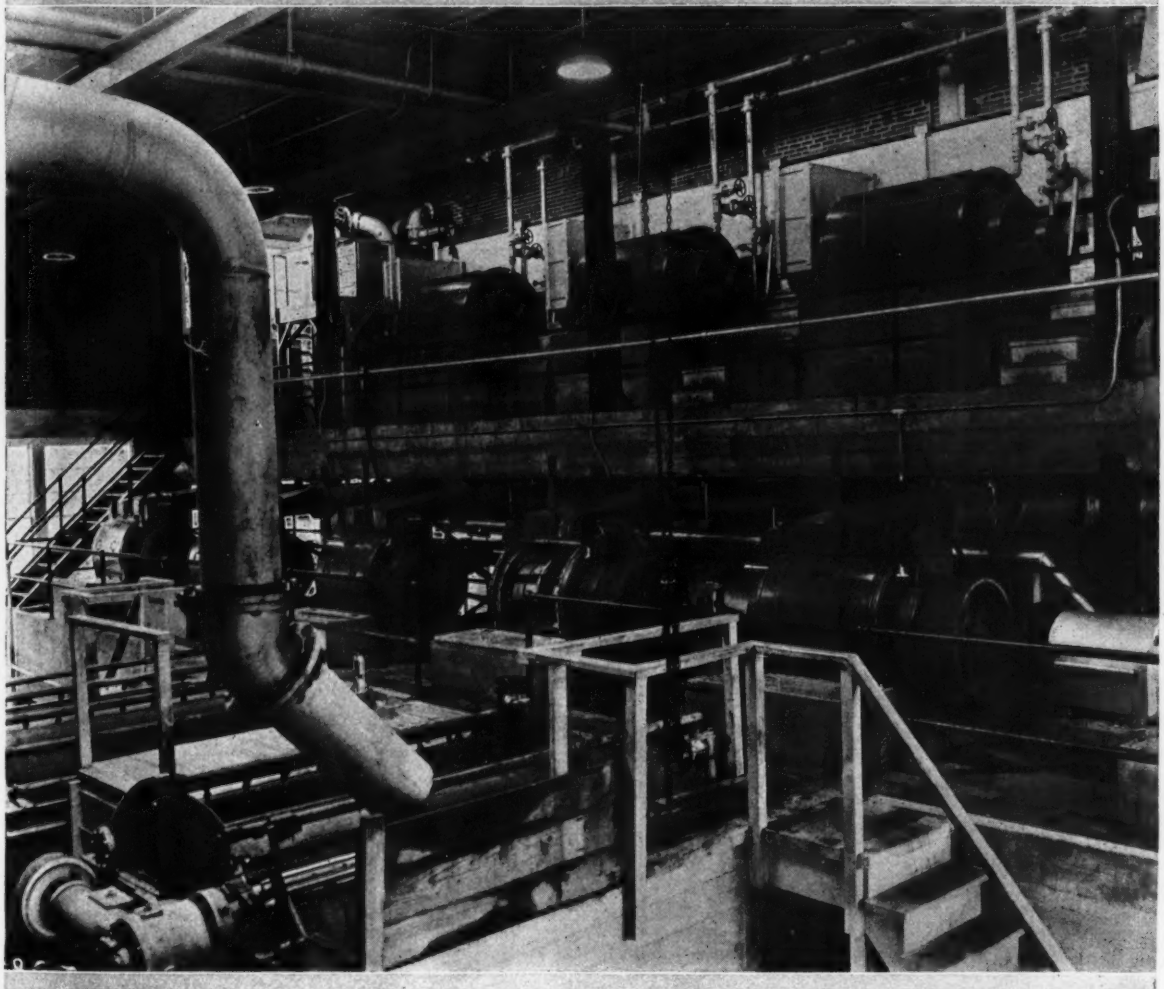
The committee in charge of arrangements was composed of Charles Charnella, assisted by J. R. Whitney, golf and Frank B. Cummings, horseshoes and bowling.

IMPCO

KNOTTERS – SCREENS and THICKENERS

furnished for the

Crossett Paper Mills



It is installations like the one shown above for this notable new mill of Crossett Paper Mills that testify to the preference for IMPCO Equipment where operating efficiency is a definite requirement.
"Impco" engineers are at your service.

IMPROVED PAPER MACHINERY CORPORATION

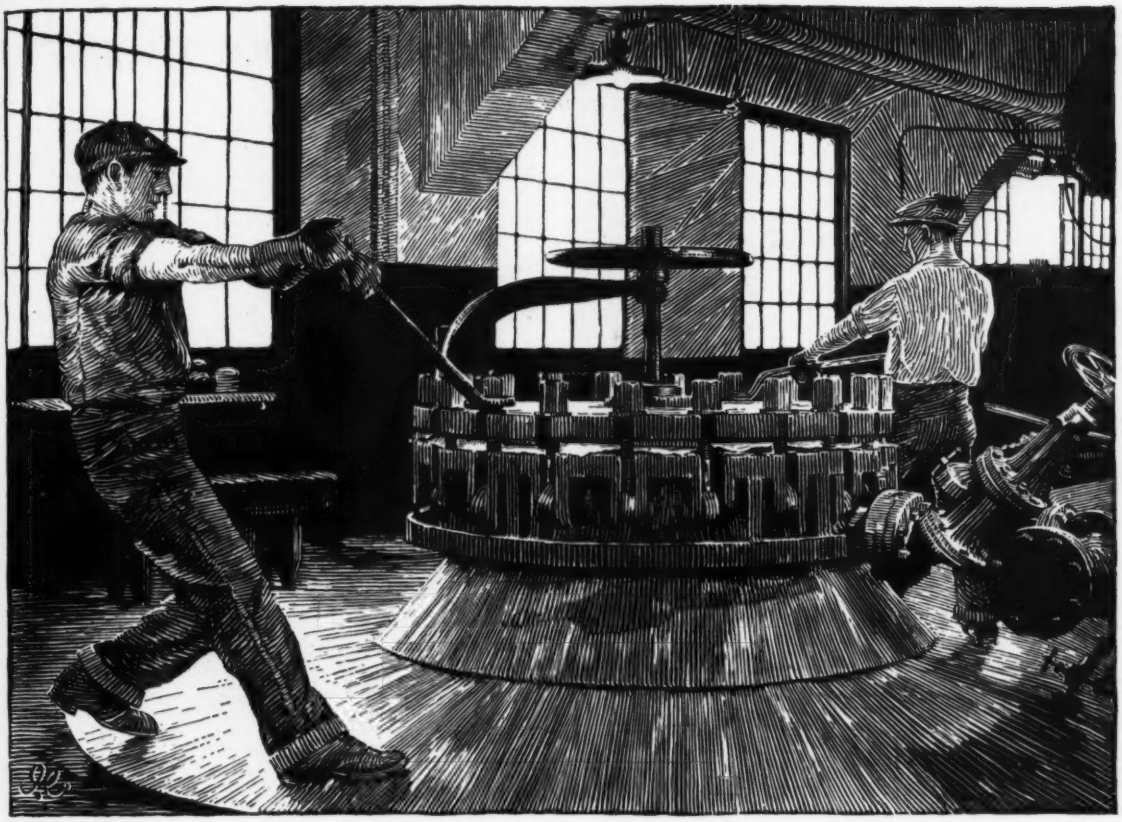
Nashua, New Hampshire

CONGRESSIONAL COMMITTEE MAKES PAPER AWARDS

(Continued from page 15)

No. 66, Barton, Duer & Koch Paper Company, 14.89 cents.
No. 67, Barton, Duer & Koch Paper Company, 14.89 cents.
No. 69, Lee Paper Company, 24.16 cents.
No. 70, Import Paper Company, 8.00 cents.
No. 71, Import Paper Company, 9.00 cents.
No. 73, R. P. Andrews Paper Company, 19.74 cents.
No. 74, R. P. Andrews Paper Company, 14.36 cents.
No. 75, R. P. Andrews Paper Company, 20.91 cents.
No. 76, R. P. Andrews Paper Company, 15.06 cents.
No. 78, R. P. Andrews Paper Company, 33.00 cents.
No. 79, R. P. Andrews Paper Company, 26.00 cents.
No. 83, Barton, Duer & Koch Paper Company, 17.59 cents.
No. 102, Stanford Paper Company, 6.45 cents.
No. 109, R. P. Andrews Paper Company, 15.52 cents.
No. 110, Aetna Paper Company, 10.468 cents.
No. 111, Aetna Paper Company, 9.268 cents.
No. 112, Aetna Paper Company, 8.968 cents.
No. 113, Aetna Paper Company, 9.348 cents.
No. 114, Aetna Paper Company, 12.468 cents.
No. 115, Aetna Paper Company, 10.188 cents.
No. 116, Aetna Paper Company, 9.588 cents.
No. 117, Aetna Paper Company, 10.148 cents.
No. 120, Barton, Duer & Koch Paper Company, 13.43 cents.
No. 121, Aetna Paper Company, 11.278 cents.
No. 122, Aetna Paper Company, 11.788 cents.
No. 123, Aetna Paper Company, 12.478 cents.
No. 125, Graham Paper Company, 22.10 cents
No. 126, Graham Paper Company, 19.05 cents.
No. 140, Old Dominion Paper Company, 27.98 cents.
No. 141, R. P. Andrews Paper Company, 23.80 cents.
No. 151, Stanford Paper Company, 7.51 cents.
No. 152, Stanford Paper Company, 7.51 cents.
No. 154, Aetna Paper Company, 10.378 cents.
No. 155, Aetna Paper Company, 11.378 cents.
No. 156, Aetna Paper Company, 11.378 cents.
No. 157, Aetna Paper Company, 11.978 cents.
No. 160, Aetna Paper Company, 11.288 cents.
No. 161, Aetna Paper Company, 11.388 cents.
No. 162, Barton, Duer & Koch Paper Company, 11.39 cents.
No. 163, Aetna Paper Company, 11.288 cents.
No. 164, Aetna Paper Company, 11.888 cents.
No. 165, Aetna Paper Company, 11.988 cents.
No. 168, Barton, Duer & Koch Paper Company, 15.39 cents.
No. 169, Barton, Duer & Koch Paper Company, 15.39 cents.
No. 170, Barton, Duer & Koch Paper Company, 15.39 cents.
No. 171 Barton, Duer & Koch Paper Company, 15.39 cents.
No. 172, Barton, Duer & Koch Paper Company, 15.89 cents.
No. 173 Barton, Duer & Koch Paper Company, 16.39 cents.
No. 180, R. P. Andrews Paper Company, 22.92 cents.
No. 181, R. P. Andrews Paper Company, 22.92 cents.
No. 184, Stanford Paper Company, 6.36 cents.
No. 190, Aetna Paper Company, 11.788 cents.
No. 191, J. R. Howarth Paper Company, 14.75 cents.
No. 192, Aetna Paper Company, 11.388 cents.
No. 193, J. R. Howarth Paper Company, 15.75 cents.
No. 196, R. P. Andrews Paper Company, 22.92 cents.
No. 198, no bids received.
No. 203, R. P. Andrews Paper Company, 10.93 cents.
No. 204, R. P. Andrews Paper Company, 10.93 cents.
No. 205, Lee Paper Company, 12.21 cents.
No. 209, Barton, Duer & Koch Paper Company, 3.98 cents.
No. 210, Barton, Duer & Koch Paper Company, 4.38 cents.
No. 211, Barton, Duer & Koch Paper Company, 5.75 cents.
No. 213, no bids received.
No. 214, no bids received.
No. 215, Whitaker Paper Company, 8.33 cents—8.08 cents (minimum order of 10,000 pounds).
No. 217, no bids received.
No. 218, no bids received.
No. 219, no bids received.
No. 220, no bids received.
No. 251, R. P. Andrews Paper Company, 10.67 cents.
No. 252, R. P. Andrews Paper Company, $4.60 per M sheets.
No. 254, Barton, Duer & Koch Paper Company, 5.85 cents.
No. 255, Barton, Duer & Koch Paper Company, 5.85 cents.
No. 256, Barton, Duer & Koch Paper Company, 7.17 cents.
No. 257, Barton, Duer & Koch Paper Company, 7.29 cents.
No. 258, Barton, Duer & Koch Paper Company, 5.85 cents.
No. 259, R. P. Andrews Paper Company, 5.59 cents.
No. 262, Link Paper Company, 7.00 cents.
No. 263, Barton, Duer & Koch Paper Company, 7.00 cents.
No. 264, R. P. Andrews Paper Company, 3.87 cents.
No. 265, no bids received.
No. 271, no bids received.

(Continued on page 52)



UNIFORMITY *of cooking procedure*

WITH uniform chips inside the digester, the start of every cook in Weyerhaeuser sulphite mills marks the beginning of careful control over the cooking process. Every precaution is taken to insure uniformity in pulps designed to meet the exacting conditions of paper production.

PULP DIVISION • WEYERHAEUSER TIMBER COMPANY

WEYERHAEUSER
SULPHITE
BLEACHED UNBLEACHED

LONGVIEW, WASHINGTON
Mills at
Longview and Everett,
Washington

Financial News of Pulp and Paper Industry

Directors of Kimberly Clark Co. Accept Resignation of C. A. Sommers as Secretary-Treasurer — F. J. Sensenbrenner Is Re-elected President— Says Need for Common Shareholders Meeting of Abitibi Is Apparent.

New York Stock Exchange

High, Low and Last for the Week Ending May 26, 1937

	High	Low	Last
A. P. W. Paper Co.	8⅞	7¾	8⅞
Armstrong Cork Co.	65	61	63½
Celotex Corp.	42⅞	41¼	41⅞
Celotex Corp., pfd.	78	75¾	78
Certain-Teed Products Corp.	17¼	15½	16
Certain-Teed Products Corp., pf.	66	64	66
Champion Paper & Fibre Co.	59⅝	57½	58¼
Champion Paper & Fibre Co., pf.	108½	108	108
Congoleum Nairn Co.	38¼	36⅜	36¾
Container Corp. of Amer.	32½	30¾	31⅜
Continental-Diamond Fibre Co.	20⅝	19⅞	20½
Crown Zellerbach Co.	20¾	19¼	19¾
Crown Zellerbach Co. cum. pf.	100¾	100	100⅛
Flintkote Co.	32½	29¾	30
International Paper & Power (a)	18⅛	17¼	17⅝
International Paper & Power (b)	12⅜	12¼	12⅜
International Paper & Power (c)	6½	6¼	6⅜
International Paper & Power pf.	104¼	100	101½
Johns-Manville Corp.	131¼	127¾	127¾
Johns-Manville Corp., pf.	124	124	124
Kimberly-Clark Corp.	42⅝	41	42⅛
MacAndrews & Forbes	32	31	31½
Masonite Corp.	58½	56	58⅛
Mead Corp.	29½	28	28½
Mead Corp., pf.	96	94	95½
Paraffine Companies, Inc.	70	69	69
Paraffine Companies, Inc., pf.	100	100	100
Scott Paper Co.	42	40	40¾
Sutherland Paper Co.	36	35	36
Union Bag & Paper Corp.	82½	78	78
United Paperboard Co.	13½	12½	12½
U. S. Gypsum Co.	112	110	111

New York Curb Exchange

High, Low and Last for the Week Ending May 26, 1937

	High	Low	Last
American Box Board Co.	21¼	20	20
Brown Co., pf.	73	67¼	67¼
Great Northern Paper Co.	42	40¾	41½
St. Lawrence Corp.	12¼	12¼	12¼
St. Lawrence Corp., pf.	32	32	32
St. Regis Paper Co.	9	8⅝	8¾
St. Regis Paper Co., pf.	105	104¾	105
Taggart Corp.	12⅜	11	12⅛

Kimberly-Clark Annual Meeting

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., May 24, 1937—Directors of the Kimberly-Clark Corporation, at their monthly meeting last week, accepted the resignation of C. A. Sommers as secretary-treasurer.

At the annual meeting following, the board elected H. G. Boon, F. E. Sensenbrenner and John R. Kimberly to the board to fill vacancies created by the death of William Bonifas, and the resignations of S. R. Stilp, Sr., and Mr. Sommers. Mr. Stilp, who was general superintendent, retired from active duty early in the spring.

Officers were re-elected by the board as follows: F. J. Sensenbrenner, president; Ernst Mahler, executive vice-president, and J. S. Sensenbrenner, S. F. Shattuck and C. H. Sage, vice-presidents. The board appointed J. F. Hunt as secretary and comptroller, W. H. Clifford as treasurer, and F. E. Sensenbrenner, assistant secretary and treasurer. Other members of the board are C. B. Clark, M. L. Emerich, John M. Hancock, Walter Kasten, James C. Kimberly and W. H. Ryan.

The company announcement said: "The directors of the Kimberly-Clark Corporation, with great regret, responded to the desire of C. A. Sommers for release from the duties of secretary-treasurer of the corporation."

Mr. Sommers entered the employ of the company on May 1, 1900 at the company's Niagara, Wis., mill, where he served under W. H. Ryan, then office manager. In December, 1906, he received promotion to the main office at Neenah. During the year 1907 he served in the capacity of purchasing agent. In January, 1909, he became associated with the late Harry Price, who had recently been invited into the official family of the Corporation, and under Mr. Price worked out a modernized cost system. In 1914, Mr. Sommers was appointed chief of the accounting department with the title of auditor, where his accurate mind and great capacity for detail distinguished him.

In 1928, he was appointed assistant treasurer, and upon the death of Mr. Price in the spring of 1930, he was elected treasurer of the corporation. The next year, 1931, the stockholders of the company elected him to the board of directors, and the board, in April, 1935, elected him to the joint office of secretary-treasurer.

Mr. Sommers' resignation becomes effective July 1.

A total of 633 women employees of the Kimberly-Clark Corporation will receive slight wage increases as the result of adoption of a new classifications by the general mill council, made up of management and employee representatives, at a meeting last week. The number represents about 90 per cent of all women employees on an hourly basis.

New Prosperity for Abitibi

TORONTO, Ont., May 24, 1937—Collin Brooks, representing large British holdings of common stock in Abitibi Power and Paper Company, who is now in Toronto, stated in an interview that the new prosperity of Abitibi was now admitted on all hands. "Its power to earn for itself new working capital," he said, "as well as to meet current interests and preferred dividends is not doubted. Unless the bond holders have some motive for refusing to accept a full financial settlement of their just claims, the problem of taking Abitibi out of receivership is merely the problem of finding the necessary new finance to satisfy those claims and to pay off the unsecured creditors.

"While the capital structure of Abitibi is admittedly different from that of either Consolidated or Price Brothers, it would be tragic for the newsprint industry and the future financial relation of the Province of Ontario if the rehabilitation of this company has to mean conflict after the harmonious settlement of the similar difficulties of the other two. But conflict is inevitable if the equity is faced by suggestions of slaughter as the alternative to impossible financing feats. It has always to be remembered that common stock holders include the small investor as well as larger holders, a fact perhaps overlooked when heavyweight financial interests discuss their complicated schemes. The need for a common shareholders' meeting is apparent."

The Fulton is *the* system for dryer drainage. That is why nearly 500 installations have been made . . . more than can be credited to all other makes combined.

What lies back of this outstanding sales record? It is the ability of the Fulton system to reduce steam costs, increase tonnage, and improve quality . . . three very important results.

Cockling, curl and broke due to improper drying are reduced to the minimum. Finer papers are the result and, of course, command higher prices. Efficient drying also permits an increase in machine speeds. Steam costs are substantially cut by keeping dryers at uniform temperatures and proper handling of condensate.

These results are not something to merely "hope for". They *can* be obtained . . . and *are* being obtained on nearly 500 paper machines. Let our engineers survey your equipment. Without obligation you can determine if a Fulton system will aid you in reducing operating costs and adding to income. The chances are it will . . . that's why we urge you to write us at once.

THE MIDWEST-FULTON MACHINE COMPANY

Dayton, Ohio

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, of Pulp and Paper Mills

Work Proceeds Rapidly on Redrock Mill

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., May 24, 1937—Construction work on the Lake Sulphite Pulp Company at Redrock, Ont., is ahead of schedule, according to an announcement made by R. O. Sweezey, president of the company, on his return to Toronto this week. "The railway spur has been completed, and with 400 men on the job active work on the foundations is progressing satisfactorily," continued Mr. Sweezey. He added that construction work would proceed on the most rapid and efficient basis as the company completed all its financing by the recent sale of common stock and by the sale of a $3,000,000 bond issue which was underwritten by a group composed of strong financial and banking interests. Thus the company is assured of funds for its construction program.

"Cutting and peeling pulpwood," said Mr. Sweezey, "has begun on the limits, some of which are within five miles of the mill site. This and other low cost wood from the adjacent settlers' lands, will be used to build up the woodpile for the mill operations next spring and summer. By midsummer construction work and woods operations will provide employment for 1,500 men."

Pacific Mills Addition

[FROM OUR REGULAR CORRESPONDENT]

VANCOUVER, B. C., May 24, 1937—Approximately $200,000 is to be spent by Pacific Mills Limited on erection of a warehouse at their large newsprint mill at Ocean Falls, B. C. In announcing plans for the construction, company officials stated that the addition would accommodate the growing volume of production, largely for the export trade, and no plant changes will be undertaken at present.

Appointment of Major W. G. Swan as engineer for the project was announced at the same time. It is not known at time of writing whether company crews will undertake the work or whether it will be let on a contract basis.

Kalamazoo Adds Equipment

Construction work is starting on an $18,000 addition at the Kalamazoo Paper Company. The building is being erected by the Miller-Davis Construction Company.

The new building, 40 by 60 feet, will be of cement and brick construction, harmonizing generally with other buildings of this paper company. The structure will house a new beater and washer and will serve as addition to Mill No. 2.

Addition of this equipment will increase production facilities at the mill and the new plant is expected to be in operation by the middle of the summer.

Construction News

Ilchester, Md.—The Bartgis Brothers Company, manufacturer of box board products, has approved plans for new addition to mill, to be one-story, 80 x 110 feet, reported to cost over $50,000, with equipment. General erection contract has been awarded to Julius A. Kinlein, American Building, Baltimore, Md., and superstructure will begin soon.

Emeryville, Cal.—The Paraffine Companies, Inc., 475 Brannan street, San Francisco, Cal., manufacturer of building and roofing papers, has awarded general erection contract to the Clinton Construction Company, 923 Folsom street, San Francisco, for proposed new addition to mill at Emeryville, recently referred to in these columns, and will proceed with superstructure at early date. New unit will be four-story and basement, 95 x 97 feet, on site at foot of Powell street, with new one-story adjoining structure, 60 x 115 feet, both to be used for general increase in production. Contract price for construction is $89,515, exclusive of equipment. L. S. Rosener, 233 Sansome street, San Francisco, is architect and engineer.

Milwaukee, Wis.—The Manufacturers' Box Company, 830 East Keefe avenue, manufacturer of paper board boxes and containers, has work under way on new one-story addition to plant, for which general contract recently was let to C. A. Kleppe & Sons, 239 West Center street, Milwaukee. Miscellaneous contracts for structural steel framing, roofing, heating, etc., have been let and it is proposed to have structure ready for service at early date. It will cost over $35,000, with equipment. F. F. Drolshagen, 647 West Virginia street, Milwaukee, is architect.

New York—The Noesting Pin Ticket Company, Mount Vernon, N. Y., manufacturer of paper specialties, has concluded negotiations for purchase of a six-story industrial building, 100 x 200 feet, at Willow avenue and 136th street, Bronx, New York, extending through to East 135th street, and will take over at once. New owner will improve and equip building for new plant, for considerable increase in present capacity. It is proposed to remove Mount Vernon plant to new location.

Los Angeles, Cal.—The Union Bag and Paper Corporation, Woolworth Building, New York, N. Y., manufacturer of paper bags and containers, has taken out a permit for superstructure for new branch plant

AN ADDRESS *To Remember*

Insist on this trade-mark when buying Felts

The paper industry knows that our Felts are outstanding for their standard, uniform quality and dependability. . . . These Felts are long-wearing and they assure paper made with the finest finish. . . . They are woven to permit machine operation at top speed at all times.

We are at your service always — just address

The Waterbury Felt Co.
SKANEATELES FALLS, N. Y.

at 4355-75 Fruitland avenue, Vernon, Los Angeles, where large tract of land recently was acquired. It will be two-story, 163 x 240 feet, estimated to cost over $175,000, including equipment. As previously noted in these columns, general erection contract has been awarded to the William P. Neil Company, 4814 Loma Vista avenue, Los Angeles, and work will be placed under way at once. Harry Miller, last noted address, is architect.

Chicago, Ill.—L. J. Hulseman, manufacturer of paper boxes and containers, has leased space in building at 1401 West Jackson boulevard, totaling about 6,200 square feet of floor space, and will equip for new plant.

Chicago, Ill.—The Illinois Paper Box Company, recently organized with capital of 3,000 shares of stock, no par value, plans early operation of local plant for the manufacture of a line of paper boxes and containers. New company is headed by H. C. Crofts and F. P. Wagner. It is represented by Harris, Reinhardt & Bebb, 29 South LaSalle street, Chicago, attorneys.

Chicago, Ill.—The Durable Coated Paper Company, 227 West Huron street, manufacturer of special stencil papers, etc., has leased a floor in the building at 29-33 South Market street, and will occupy for new paper-converting plant. Present works will be removed to new location and capacity increased.

Lufkin, Tex.—The Southland Paper Mills, Inc., recently organized, care of E. L. Jurth, president, Angelina County Lumber Company, Lufkin, company official, is considering early purchase of large tract of land at Lufkin, as site for proposed new pulp and paper mill for the manufacture of newsprint, originally projected a few months ago and previously referred to in these columns. It will consist of a group of one and multi-story units, with power house, machine shop and other mechanical buildings, and will be equipped for an initial capacity of about 150 tons of finished newsprint per day, with ultimate output approximating 300 tons. New plant is estimated to cost close to $5,000,000 including pulp wood operations in Southern pine timber areas in that vicinity for raw material supply, where saw mills and other production facilities will be provided. Wirt Davis, chairman of board, Republic National Bank & Trust Company, Dallas, Tex., and Nathan Adams, president, First National Bank, Dallas, are interested in new company. Perkins, Goodwin Company, 30 Rockefeller Plaza, New York, will be active in management and operation of new mill. It is understood that George F. Hardy, 305 Broadway, New York, consulting mill engineer, will prepare plans for new mill and supervise construction.

Cleveland, Ohio—The Dobeckmun Company, 3301 Monroe avenue, manufacturer of cellophane containers and specialties, has plans under way for new one-story addition to converting plant, estimated to cost close to $50,000, including equipment. Bids are scheduled to be asked at early date. George S. Rider Company, Terminal Tower Building, Cleveland, is architect and engineer. T. F. Dolan is president.

Chicago, Ill.—The Acme Novelty Manufacturing Company, manufacturer of paper specialties, has leased a floor in building at 557 West Jackson boulevard, totaling about 6,000 square feet of floor space, and will occupy for new plant. Equipment will be installed at once.

Jersey City, N. J.—The United Wall Paper Factories, Inc., 151 Westside avenue, has sold a tract of land, about 80,000 square feet, on Westside avenue, improved with one and two-story buildings of about 15,000 square feet floor area, and boiler house, to the Metro Glass Bottle Company, 135 Westside avenue, which will take over at once and use for a new line of operation.

Elizabethton, Tenn.—The North American Rayon Corporation, manufacturer of cellulose rayon products, has arranged a fund of $2,500,000 for expansion and improvements in mills during 1937, including new buildings and installation of equipment for increased capacity. Main mill of company is at Elizabethton, where work recently has begun on new addition to power house, to include installation of additional equipment for enlarged output. Main offices of company are at 261 Fifth avenue, New York.

Ashtabula, Ohio—The Iten Fiber Company, 5403 Bower avenue, Cleveland, Ohio, manufacturer of fiber sheets, tubing and kindred specialties, is completing plans for new plant at Ashtabula, comprising main one-story unit, estimated to cost close to $50,000, including equipment. Work will begin on superstructure at early date. C. J. Iten is president.

Chicago, Ill.—Murnane Paper Company, 218 North Clinton street, paper products, has leased two floors in building at 217-23 North Desplaines street, totaling about 18,000 square feet of floor space, and will occupy for local headquarters, including storage and distributing facilities.

New Companies

New York—The Brady and Shea Paper Stock Company, Inc., has been incorporated with capital of 100 shares of stock, no par value, to deal in paper products of various kinds. New company is represented by William Rosenzweig, 154 Nassau street, New York, attorney.

Wilmington, Del.—The Mid-States Gummed Paper Company, care of the Corporation Trust Company, Industrial Trust Building, Wilmington, has been chartered under state laws with capital of $675,000, to manufacture gummed and coated paper goods, and kindred special paper products.

Milwaukee, Wis.—Paper and Cordage, Inc., Milwaukee, has been chartered under state laws to deal in paper products of various kinds. New company is represented by William L. Stemper, 238 West Wisconsin avenue, Milwaukee, attorney.

Chicago, Ill.—The North Avenue Paper Stock Company, 1917 West North avenue, has been incorporated with capital of $5,000, to deal in paper products. Incorporators include H. Lissner and A. Nachman. New company is represented by Schwartz & Cooper, 105 West Monroe street, Chicago, attorneys.

Los Angeles, Cal.—The Clark Bag Manufacturing Company has filed notice of organization to manufacture and deal in paper bags and kindred containers. Willis E. Clark, 5125 Hub street, Los Angeles, is head.

Brooklyn, N. Y.—Jay-Frank, Inc., has been organized to manufacture and deal in paper boxes and containers. New company is represented by A. Edward Quartin, 750 New York avenue, Brooklyn, attorney.

Philadelphia, Pa.—The Toll Paper Products Company, 26 Strawberry street, has filed notice of organization to deal in paper products of various kinds. New company is headed by Aaron Toll, 4606 North Hutchinson street, Philadelphia.

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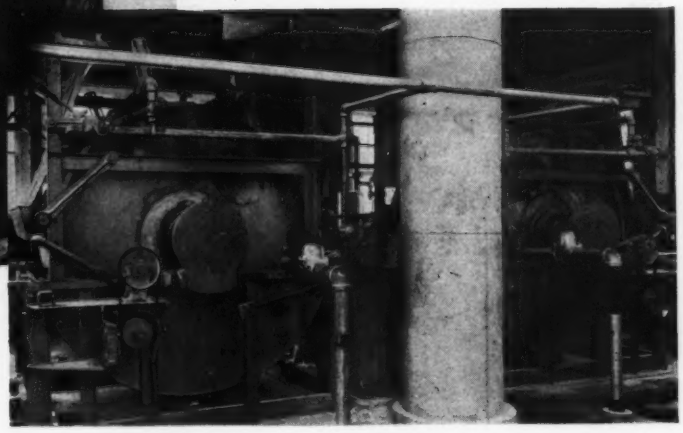

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COMING EVENTS IN THE PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY—Fall Convention, DeSoto Hotel, Savannah, Ga., Oct. 18-20, 1937.

NEW ENGLAND SECTION, Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Nonotuck Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION, Technical Association of the Pulp and Paper Industry—Fourth Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION, Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION, Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park-American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION, Annual Meeting, Springfield, Mass., June 23-25.

FULL RE-EMPLOYMENT NEAR

Congress was urged on Monday by the National Association of Manufacturers to avoid "new restrictive, experimental legislation" which might interrupt the swift strides that are being made toward full re-employment.

At the same time the Association reiterated its recommendation that legislation be enacted at the present session of Congress to eliminate gainful child labor under sixteen years of age.

The Association pointed out, in its bulletin to members, that manufacturing employment is now at or above 1929 levels and that a shortage of skilled labor already is apparent in many localities and industries.

"Employment in manufacturing industries continues its steady rise," the Association said. "As a result, employment and purchasing power in other fields is also moving upward.

"Since 1933 more than 3,000,000 persons have found jobs in manufacturing, 66 per cent of them in the durable goods industries.

"The Department of Labor reports that between February 15 and March 15 alone 305,000 found jobs, with an increase of $15,100,000 in industrial payrolls.

"Although the number of those now employed in manufacturing is as large or larger than in 1929, there are many indications that by the end of the year the total will be even larger.

"The most disturbing influence in the offing at this time is the threat of new restrictive, experimental legislation which will plunge the country into another period of doubt, uncertainty and confusion, and which might seriously impair industry's march toward more jobs for more people.

"What the effects of renewed attempts upon the part of the Federal government to regulate wages and hours in every locality and plant will be none can foresee accurately at this time.

"It is a known factor, however, that arbitrary wage and hour restrictions seeking to blanket the entire country under one enactment must inevitably lead to confusion during a time of steady recovery.

"It is also known that sudden increases in wages and decreases in hours must be added to the cost of production, which in turn must be paid by the consumer and particularly the farmers, who form a major purchaser of the products of industry.

"We know, too, that re-employment has been almost constant month by month since the end of the last attempt to interfere with the normal flow of production by an experiment in national control of wages and hours.

"That such legislation would put 8,000,000 persons back at work, as has been reported from some sources in Washington, is manifestly inaccurate.

"It is doubtful, based upon all estimates available, that there are that many persons today unemployed and desirous of working. A shortage of skilled labor is already apparent in many localities and industries.

"Manufacturing industry, at its peak in 1929, employed about 11,000,000 persons, and today it has that many again upon the payrolls, many of them at higher wages than in 1929.

"The next step is to consolidate these gains and go forward to new objectives. Cooperation by all-government, industry and labor—is essential, with protection for the public paramount. There must be neither an upward spiral that will lead to skyrocketing prices, nor a downward spiral that will again lead to unemployment.

"Congress can, and should enact, however, legislation utilizing its powers over interstate commerce to eliminate the gainful labor of children under sixteen years of age."

PAPER IN SELLERS' MARKET

Paper is now in a sellers' market and profit for 1937 will be higher in almost all divisions of the industry, but to hold profits in 1938 and 1939, when new sources of supply in wrapping and bag paper and container board come into the market, will call for a new order of cooperative management, Shields & Co. concludes in a research report on the industry, issued last week.

"The industry is alive to this problem," the report says, "but even with the example of the newsprint collapse so freshly in mind, a dog fight for the available volume in some lines is likely within the next two years." By the end of 1938, the report indicates, the container-board industry in the South probably will feel the effects of rapid expansion, especially if new plants or second or third choice sites are rushed in for promotional purposes.

"This would be felt first by the high-cost Northern mills," the firm points out. "Following out the traditional pattern in the industry, it would cause a period of readjustment in which mills would shift from one grade to another in pursuit of a product on which a satisfactory profit could be obtained. The alternative is a form of industrial control by which production would be allocated among the mills."

Analyzing the newsprint situation, the report states that beyond question newsprint can be and will be made from Southern pine. Commercially it will have to compete with Northern newsprint that is improving continually and with the efforts of Northern producers to avoid scrapping their investment. But although the pioneers in Southern newsprint will have to face problems aside from technical questions of production, the report holds that the industry logically will develop in that region.

Over a period of years still further expansion is seen as required in the American pulp and paper industry, first, to replace European pulp, and second, to take care of increasing per capita consumption in this country. Except for possible modest increases in sulphate pulp production in Finland, the Scandinavian countries are reported to have reached the limit of annual wood growth in their production of pulp and are withdrawing from the American market to reach the nearer European consumers.

"Business depression abroad would increase their offerings again in this country and their costs could dictate American prices," the report says.

Protecting Pulpwood in North

TORONTO, Ont., May 24, 1937—The Federal and Provincial Governments are mobilizing their forces against the saw fly which is attacking Canada's pulpwood lands and the net result of their efforts will be an intensive campaign with some 2,500 watchers in the forests of Ontario operating on the same lines as fire rangers and reporting every sign of the pest in the same way a blaze is notified. It was stated by the Agricultural Department that they were planning to guard against the spread of the saw fly and of fire. Rangers are being asked to report promptly of the outbreak or appearance of the insect. It has, however, got a tremendous start. Rangers are being asked to examine the trees once a month from July 1. They beat the trees and the falling insects are caught on mats and then sent in boxes to the Agriculture Department for study. The Gaspe Peninsula has suffered badly in the past. Throughout the Peninsula the spruce has been killed

Production Ratio Report

The following statistics are based upon paper production reports to the American Paper and Pulp Association:

COMPARATIVE MONTHLY SUMMARIES

Months	1937	1936	1935	1934
January	90.3%(c)	76.1%	65.8%	.....
February	90.1%(c)	77.9%	70.0%	.....
March	90.3%(c)	76.0%	70.5%	.....
April	92.1%(c)	82.3%	70.0%	.....
May	.....	81.6%	69.4%	.....
June	.....	80.7%	72.3%	.....
July	.....	77.3%	64.9%	.....
August	.....	81.5%	70.9%	.....
September	.....	80.5%	71.9%	58.2%
October	.....	87.6%	75.6%	64.7%
November	.....	88.0%	75.3%	61.7%
December	.....	85.9%	71.2%	59.6%
Year Average	.....	81.3%	70.5%	.....
Year to Date				
First 19 weeks..	90.6%(c)	78.4%	68.9%	.....

COMPARATIVE WEEKLY SUMMARIES

CURRENT WEEKS, 1937		CORRESPONDING WEEKS, 1936	
*May 8	89.8%(c)	May 9	81.4%
*May 15	90.0%(c)	May 16	81.9%

The following statistics show the number of mills reporting by ratio groups:

Ratio Limits	Number of Mills Reporting, Current Weeks: May 8, 1937	May 15, 1937
0% to 50%	33	34
51% to 100%	272	179
Total Mills Reporting	305	213

* Subject to revision until all reports are received.
(c) Basic capacity data have been adjusted to correspond with ratings reported on January 4, 1937 Machine Improvement Survey.

PAPERBOARD OPERATING RATIOS

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours," were as follows:

Mos.	1937	1936	1935	1934	Mos.	1937	1936	1935	1934
Jan.	80%(e)	61%	61%	....	July	....	69%	59%	....
Feb.	86%(e)	67%	67%	....	Aug.	....	75%	65%	....
Mar.	87%(e)	68%	67%	....	Sept.	....	76%	69%	62%
April	....	70%	61%	....	Oct.	....	82%	76%	63%
May	....	68%	61%	....	Nov.	....	79%	70%	56%
June	....	68%	65%	....	Dec.	....	74%	60%	52%

Week end. April 10, 1937—87%
Week end. April 17, 1937—88%
Week end. April 24, 1937—89%
Week end. May 1, 1937—87%
Week end. May 8, 1937—87%
Week end. May 15, 1937—83%

(e) Basic figures revised to include new members of the National Paperboard Association.

Government Paper Awards

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 26, 1937—The Cauthorne Paper Company has been awarded the contract by the Government Printing Office for supplying 71,600 pounds (400,000 sheets) of 33 x 43 white antique book paper at 6.17 cents per pound.

Also Walker-Goulard-Plehn Company will furnish 50,000 pounds (50,000 sheets) of 26 x 38 No. 50 chip board at 2.14 cents per pound and the R. P. Andrews Paper Company will furnish 40,000 pounds of supercalendered book paper in 28½ inch rolls at 6.11 cents per pound. Bids for all of these items were received on May 10.

A. W. Macvie to Visit England

KALAMAZOO, Mich., May 20, 1937—Mr. and Mrs. Alexander W. Macvie, 1414 Portage street, will sail for England on the *Aquitania*, June 2. They will tour England, Wales, Scotland, Sweden and Norway, and will return to the States by way of Montreal, early in September. Mr. Macvie is a dealer in all grades of wood pulp, English clay and alum.

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Simplified Volumetric Determination of Alpha, Beta and Gamma Cellulose in Pulps and Papers

By Herbert F. Launer

Abstract

A relatively rapid and simple method for the determination of alpha, beta, and gamma cellulose is described. The method ordinarily employs a 0.3-g sample, which need not be weighed accurately, but a 0.03-g sample also gives fair results. Neither ash nor moisture determinations are involved, in fact, no precision weighings are made. The cellulose is oxidized by potassium dichromate solution, the strength of which need not be known accurately, as the concentrations of the oxidimetric solutions do not enter into the calculations. The volumetric results are in good agreement with those of a gravimetric method, and are as reproducible, for widely different materials. The actual working time for four complete determinations is 1½ to 2½ hours. Fundamental facts recently found concerning the separation of the cellulose fractions have been incorporated in the method. A calculation based upon the volumetric and gravimetric data for alpha cellulose indicates that the pentosans in the pulps studied are distributed among the alkali-soluble and alkali-insoluble fractions in approximately the same ratio as cellulose. It was also found that the amount of beta cellulose which precipitates is dependent upon the temperature, and that the separation should be made without heating the acidified filtrate.

Cellulose consists analytically of three fractions, alpha, beta, and gamma, which terms have been defined frequently in the literature. (1 2 3 4 5 6 7)

The alpha fraction is the cellulose which can be filtered from a mixture consisting of sodium hydroxide solution and the material being analyzed. Further differentiation is obtained by acidification of the filtrate, whereupon the beta fraction precipitates, and the gamma fraction remains in solution. Such a definition is dependent upon the factors involved in the separation, such as amount and concentration of the sodium hydroxide solution, the physical state of the fibers, such as freeness and extent of fibrillation, the time of contact between solution and fibers, and the method of filtering and washing. Thus, the values obtained for the cellulose fractions depend upon the particular method used, although the values found in the literature for certain well-known materials differ by only 1 to 2 per cent.

A high content of alpha cellulose usually indicates good quality, as for example, stability of the finished material, other things being equal. The interest in beta and gamma cellulose seems to be solely academic. The correlation between the quality of the cellulose product and the alpha-cellulose content is, however, not close enough to indicate which of the existing methods yields the most useful values. Furthermore, the experiments of Porrvik *(5, 7)* and of Lewis and Browning indicate that alpha cellulose will dissolve indefinitely if treated with fresh portions of sodium hydroxide solutions. Apparently no practicable method for routine and control work can yield a value which is a fundamental constant for a given material.

It seems, therefore, that the only criteria for the suitability of a given method are its simplicity and rapidity of execution, and its reproducibility, not only as regards agreement between duplicate determinations, but also as regards comparison between various papers among themselves, or with the original pulp. It frequently happens that a pulp may be filtered in 5 to 30 minutes, whereas a paper made from the pulp may require 3 to 5 times as long, sometimes 3 to 4 hours in extreme cases. The corresponding alpha-cellulose values obtained by commonly used methods would not be comparable for such a case, for, as Porrvik and Lewis and Browning have shown, large differences (2 per cent, within a given method) in alpha-cellulose content may arise from variations in the rates of filtration, unless the cellulose-alkali mixture is allowed to stand a certain length of time after dilution. The rate of filtration appears to have very little effect if the mixture is filtered 1 hour or more after dilution. It appears that all the reactions between cellulose and alkali should be given a sufficient length of time to reach equilibrium. This applies to the washing as well as to the mercerization.

The alternative of allowing a reaction to reach equilibrium in order to achieve reproducibility is to allow the reaction to proceed for a definite length of time. The Faserstoff-Analysenkommission *(8)* specify exactly 5 minutes for washing the alpha cellulose with a definite quantity of 8-per cent alkali. This is impossible to regulate in the case of paper, which fact is tacitly recognized by them, since they consider their method to be applicable only to pulps.

At the National Bureau of Standards it was necessary to develop a method which would be valid for the analysis

not only of pulps but also of the papers usually causing difficulties in filtering. Special attention was paid to the aspects of simplicity, rapidity of operation, and reproducibility, especially of the type mentioned. The mercerizing procedure of Lewis and Browning was adopted, including observance of the time necessary to reach equilibrium in the swelling in 17.5-per cent, and subsequent standing in the diluted (7.3-per cent) alkali. The alpha cellulose was washed with water only.[10] In this way, any uncertainties arising from variations in the rate of washing with sodium hydroxide solutions are avoided. Furthermore, the ratio of the volume of alkali to the weight of sample has been made unusually large to minimize errors due to "drop losses."

The method described in the present article is based entirely upon volumetric procedures. It is simple and rapid, since no precision weighings are involved, and since the sample taken for analysis is small, 0.3-g. Moisture and ash determinations on the ground material, indispensable in other methods, are not made. The entire alpha-cellulose portion, and large aliquot parts of the filtrate, one-half and one-quarter, for the beta plus gamma, and gamma portions, respectively, are oxidized with dichromate solution, the strength of which need not be known accurately. The method, using a 0.3-g. sample, is shown to be equal in precision to gravimetric methods employing much larger samples. Even a 0.3-g. sample was found to yield fair results. Aside from the obvious advantages of a precision method which is applicable when only small samples are available, the use of a small sample has the advantage that the entire separation even in the worst cases requires less than one-half hour. The 3 to 5-g. samples ordinarily employed require up to 3 or 4 hours in such cases. For most pulps, eight complete separations of the alpha from the soluble cellulose can usually be made per hour with the method described in this article. For most papers, the corresponding number per hour is six to seven. Thus, four complete determinations of alpha, beta, and gamma cellulose require an actual working time of 1½ to 2½ hours, which is about one-eighth to one-fourth of the time necessary for the same number of determinations by any other method.

Bray and Andrews *(4)* who adapted Bronnert's *(3)* method for determining alkali-soluble cellulose with dichromate to the alpha, beta, and gamma cellulose determination, discuss further advantages inherent in volumetric methods. Their procedure involves, however, the usual moisture and ash determinations, and recommends the standardization of the potassium dichromate solution against "Cross and Bevan cellulose" from sulphite pulp. They limit their comparison of the volumetric and gravimetric results to a study of spruce sulphite pulp. However, their method of filtration is not suitable for paper analyses and they take one-tenth and one twenty-fifth aliquot parts for the alpha, beta plus gamma, and also gamma fractions, respectively, whereby errors in the dichromate determinations are multiplied by 10 and 25.

Porrvik *(7)* uses a volumetric method which is peculiarly adapted to the needs of the rayon industry. In this method only a partial (5/8) separation of alpha from beta and gamma cellulose is attempted, and very small aliquot parts, 1/120 and 1/150, for the alpha and gamma portions, respectively, are taken. Furthermore, Porrvik works only with bleached sulphite pulp and makes no comparison with the results of a gravimetric method for alpha cellulose.

The gravimetric methods ([1 2 3 5 6]) include for duplicate determinations, 22 precision weighings, including 12 for moisture and ash; 6 more are necessary if beta cellulose is to be determined.

The materials studied in this work were soda pulp, refined sulphite and sulphate pulps, known on the market as "alpha" pulp and bleached sulphate, respectively, also no. 1 old white rags, no. 1 new white rags, and no. 1 new white rag paper. The resins in these materials did not in any case exceed 0.2 per cent, and were neglected. It will be shown in a later paper that this has no effect upon the results and also that a correction may be applied for larger amounts of resin.

Method in Detail

Mercerization and Filtration

Approximately 0.3-g. of the material reduced to fibrous condition in a "Dr. Koerner-type" grinder and well-mixed[4] is weighed in a 100-cc. beaker to the nearest 10 meg. 20.0 cc. of 17.5-per cent[5] sodium hydroxide solution is added to the sample, which is then macerated until uniformly wet and dispersed, and allowed to stand for 10 minutes. 33.0 cc. of water is then added, the mixture thoroughly stirred, and allowed to stand for 1 hour, stirring once during the interval. After stirring once more, about 5 cc. of the unsettled mixture is poured into a Gooch crucible and allowed to drain without suction. The filtrate and wash water run directly into a 100-cc. volumetric flask. With very gentle suction (pressure differential 10 to 20 mm. of Hg) the mat is formed through which the rest of the mixture is filtered. By avoiding excessive packing of the fibers owing to strong suction, very rapid filtering is usually secured. If the mat was successfully formed at the outset the filtrate is poured back through it only once. The mat without being broken up is then washed with 35 cc. of water. The filtrate is diluted to the mark and treated as described later in section 3. The alkali-cellulose mixture, as well as the water and sodium hydroxide solution, are kept at 20.0±0.1 deg. C.

Treatment of the Alpha Cellulose

The alpha cellulose is moistened and removed from the crucible. The crucible is placed upright in a 400-cc. beaker and filled with 25 cc. of 12*M* (approximately 75 per cent, by weight) sulfuric acid, at room temperature, and then rinsed after a few minutes with 50 cc. more of the acid. The alpha-cellulose pad is then disintegrated in the acid using a thermometer as stirring rod. After the alpha cellulose has dissolved, 25.00 cc. of potassium dichromate solution[5] is added. The solution is heated to 140 to 150 deg. C, at which temperature it is maintained for approximately 10 minutes. Air is constantly bubbled in a fine stream through the solution to prevent troublesome bumping. The breaker should be covered with a watch-glass cut or notched to permit entrance of the thermometer and bubbling tube.

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[2] Thirty-five cc. of water is sufficient. It was found that further washing extracts no more cellulose.

[3] In Schriften des Vereins der Zellstoff und Papier-Chemiker 13. Die chemische Untersuchung pflanzlacher Rohstoffe und der daraus abgeschiedenen Zellstoff, compiled by C. G. Schwalbe. Published by Verlag der Papier-Zeitung, C. Hofmann, Berlin (1920). It is a report on the secret process of the Bayerische Glanzstoffwerke, and is very incomplete.

[4] The use of a small sample requires that the material be well mixed after grinding. This can readily be accomplished by such an apparatus as is described by Lewis and Browning. The present writer used an upturned bell jar, 30 cm. diameter by 22 cm. depth, upon which fits a heavy wooden lid, carrying a small motor and fan. By the proper placing of a vane to produce cross currents, the mixing of 40 g of material in 20 min. was found to produce a sufficiently homogeneous sample, as the chemical tests showed.

[5] Made by diluting the 50 per cent solution, from which the sodium carbonate has been allowed to settle, to 5.22*N*, when titrated with standard acid using phenolphthalein. An excess of barium chloride is added at the beginning of the titration to remove carbonate from solution.

[6] The solution is made up directly from oven-dry (100 to 110 deg. C.) $K_2Cr_2O_7$ by dissolving 90.00 g. in water at 70 to 90 deg. C, allowing to cool to 20 deg. C, and diluting to 1 liter. Its calculated normality is 1.835, but one of the advantages of the present method is that an exact knowledge of the strength of any of the oxidimetric solutions is not necessary.

After the solution has cooled to 130 to 140 deg. C, 50 cc. of water is added, the thermometer, etc., are rinsed down, and the solution cooled to 60 deg. C or lower. The remaining dichromate is then most simply titrated electrometrically[6] with 0.5*M* ferrous ammonium sulphate solution.[7]

Treatment of the Filtrate

Beta Plus Gamma Portion

50.00 cc. of the filtrate is pipetted into a 400-cc. beaker containing 5.00 cc. of the potassium dichromate solution. Cautiously, and with constant stirring, 50 cc. of concentrated sulphuric acid is slowly poured down the side of the beaker. The solution is then heated and later titrated as in part 2.

Gamma Portion

The pipette used to deliver the beta plus gamma portion is rinsed out into the remaining filtrate, which is then acidified with 15 to 16 ml of 6.0N sulphuric acid, using no indicator. After cooling, the cloudy mixture is diluted to 100 cc., poured into a Nessler tube of graduate cylinder and allowed to stand overnight. After the beta cellulose has settled, a 50.00-cc. portion of the supernatant liquid is cautiously removed and treated exactly as noted in part (a). The beta plus gamma mixture should be at room temperature while the gamma portion is removed.

Treatment of the Values Obtained

Calculation of the Percentages of Alpha, Beta, and Gamma Cellulose

The percentage of each fraction of cellulose is calculated by dividing the volume of dichromate corresponding to it by the total volume of dichromate for all three fractions. For example, if the alpha cellulose used 18.48 cc., and the beta plus gamma cellulose used 3.48 cc. of dichromate, then the total cellulose dichromate value is 21.96 cc., and the alpha-cellulose content[8] is

$$\frac{18.48}{18.48 + 3.48} \times 100 = 83.8 \text{ per cent.}$$

The gamma-cellulose content is calculated in a like manner. The beta-cellulose content is found by difference.

Calculation of the Total Cellulose Content of the Sample

A knowledge of the total cellulose content of the ground material, although not involved in the method for determining alpha, beta, and gamma cellulose, is necessary for use in other chemical tests, such as copper number, pentosans, etc. If these tests are to be made, the sample for the determination of alpha, beta, and gamma cellulose is weighed to the nearest 1 to 2 mg. instead of 10 mg. From this weight and from the volume of dichromate for total cellulose, the total cellulose content may be calculated.

For this calculation the equivalent weight of cellulose, $C_6H_{10}O_5$, is taken to be 162.1/24=6.75 g. From this and from the strength of the dichromate solution, 1.835N, it is calculated that 1 cc. of dichromate solution will oxidize 0.0124 g. of cellulose. From the weight of the sample taken for the determination of alpha cellulose 0.300 g., and the volume of dichromate for total cellulose,[9] 21.96 cc., for example, the total cellulose content of the sample is

$$\frac{21.96 \times 0.0124}{0.300} \times 100 = 90.8 \text{ per cent.}$$

The values so calculated are listed in Table I as total cellulose content (volumetric), and may be compared with the values of total cellulose content (gravimetric). The latter were obtained by determining gravimetrically the moisture and ash content, using standard procedures, and assuming the remainder of the material to be cellulose.[10]

The values for the total cellulose content (volumetric) are sufficiently accurate[11] for the purpose stated.

The elimination of the moisture and ash determinations on the ground sample constitutes a substantial saving of time in routine control and even research work.

TABLE I.—COMPARISON OF THE TWO METHODS FOR OBTAINING THE TOTAL CELLULOSE CONTENT OF PULPS AND PAPERS

	Materials					
Method	[a] 1035 (no. 1 new white rag paper)	1009 (no. 1 old white rags)	1039 (refined sulphate pulp)	1018 (soda pulp)	988 (refined sulphite pulp)	1008 (no. 1 new white rags)
Total cellulose content, gravimetric (%)...	84.96	93.38	91.25	91.86	92.27	93.12
Total cellulose content, volumetric (%)....	84.3	93.4	90.8	91.4	91.6	92.8

[a] The numbers are those used in connection with other experiments. See Shaw and O'Leary, Study of the effect of fiber components on the stability of book papers. J. Research NBS 17, 859 (1936) RP949.

Experimental Results and Discussion

Volumetric Values for Alpha Cellulose Compared With the Gravimetric Results

The validity of a volumetric method is usually determined by a comparison with the results of a gravimetric method. Accordingly, a 1-g. sample of each material studied was subjected to the same treatment as the 0.3-g. sample for the separation of the cellulose fractions. The same ratio of alkali volume to weight of sample, was, of course, maintained. The alpha cellulose was filtered in a Gooch crucible provided in this case with a small piece of cotton cloth as filtering medium. The residue was first washed with 100 cc. of water, allowed to soak for 10 minutes in 20-per cent acetic acid, and finally washed with 500 cc. of water, the pad being constantly broken up with a pointed stirring rod. It was then dried, weighed, and ignited as usual. The alpha-cellulose values were calculated on the basis of the oven-dry ground sample, corrected likewise for ash.

The gravimetric results are shown in column 2, Table II, and are to be compared with the volumetric results in column 3. The values agree well with those in the literature for the corresponding materials. *(5)*[12] The values for alpha cellulose in column 6 are calculated according to the method of Bray and Andrews, (4) using, however, the theoretical factor 0.0124 g. of cellulose per milliliter of 1.835N dichromate solution.

Aside from demonstrating the validity of the volumetric results, table 2 allows some interesting deductions concerning the behavior of the pentosans in these materials. Pulps 1039, 1018, and 988 had pentosan contents of 10.7, 21.3, and 3.8 per cent, respectively.[13] It is evident that the distribution of pentosans between the alpha and the beta plus gamma fractions was such that the presence of

[6] A relatively inexpensive galvanometer with a sensitivity of 0.5 to 1 microampere per millimeter scale division, used in circuit with an ordinary sliding-contact rheostat, platinum electrode and calomel half-cell will suffice. The same titration may also be carried out, however, less rapidly, using potassium ferricynide as outside indicator, in which case, 400, rather than 50 cc. of water is added before titrating the dichromate in the alpha-cellulose determinations.

[7] Contains 195 g. of $Fe(NH_4)_2(SO_4)_2.6H_2O$ and 10 ml. of concentrated H_2SO_4 per liter. If the solution is kept out of contact with oxygen its strength remains fairly constant.

[8] These as well as all corresponding figures have been corrected for the sulphuric acid blank, which is usually 0.01 to 0.02 cc. of dichromate per 50 cc. of sulphuric acid. This is determined under typical test conditions.

[9] Total cellulose dichromate values are given in Table II, column 5.

[10] The values so obtained are used directly in the copper-number determination, wherein no attempt is made to distinguish pentosans from cellulose. The corrections for resin, etc., are negligible for the materials listed but may be made when significant, as will be shown in a later paper.

[11] The greatest disagreement between volumetric and gravimetric values in table 1 is 0.7 per cent and the average is 0.4 per cent. The standard method for the determination of copper number in paper, TAPPI tentative standard, T430m, specifies an agreement between duplicates of 0.1 copper-number unit. This corresponds to 2.5 per cent for even relatively high copper numbers of 4.0.

TABLE II.—ALPHA-CELLULOSE VALUES BY THE VOLUMETRIC AND THE GRAVIMETRIC METHODS COMPARED.

1 Materials	2 Gravimetric method for alpha cellulose Per cent	3 Volumetric method for alpha cellulose Per cent	4 Alpha-cellulose dichromate values cc.	5 Total cellulose dichromate values cc.	6 Bray and Andrews method for alpha cellulose Per cent
1035 (No. 1 new white rag paper)	95.1	95.0	19.39	20.41	...
	94.8	94.8	19.32	20.37	...
	94.9	95.0	19.38	20.40	...
	...	94.9	19.35	20.38	...
Average	94.9	94.9	19.36	20.39	93.2
1009 (No. 1 old white rags) (washed)	90.6	90.6	20.46	22.58	...
	90.4	90.4	20.40	22.58	...
	90.6	90.1	20.38	22.61	...
	...	90.5	20.45	22.60	...
Average	90.5	90.4	20.42	22.59	90.4
1039 (refined sulphate pulp) (bleached sulphate)	84.0	83.9	18.42	21.94	...
	84.0	84.2	18.51	21.97	...
	83.6	84.2	18.48	21.95	...
	...	84.2	18.49	21.97	...
Average	83.9	84.1	18.48	21.96	83.8
1018 (soda pulp)	77.5	78.6	17.37	22.10	...
	77.7	78.3	17.35	22.13	...
	77.9	77.5	17.15	22.12	...
	...	78.6	17.38	22.10	...
Average	77.7	78.2	17.31	22.11	77.8
988 (refined sulphate pulp) ("Alpha" pulp)	90.8	90.5	20.09	22.19	...
	90.6	90.6	20.08	22.16	...
	90.7	90.5	20.05	22.15	...
	...	90.6	20.04	22.13	...
Average	90.7	90.6	20.06	22.16	89.8
1008 No. 1 new white rags (washed)	96.6	96.0	21.56	22.46	...
	96.5	96.3	21.65	22.48	...
	96.4	96.3	21.56	22.39	...
	...	96.2	21.57	22.41	...
Average	96.5	96.2	21.59	22.42	95.8

pentosans did not cause serious differences between the volumetric and gravimetric results This requires that the pentosans be distributed between the alkali-soluble and alkali-insoluble portions in approximately the same ratio as cellulose, which may be calculated from the following considerations. On the basis of the formula for pentosans, $C_5H_8O_4$, it is calculated that 1 cc of dichromate will oxidize 0.0220 g. of pentosans, as against 0.0124 g. of cellulose.

From the simple relation:

$$\frac{\frac{\text{wt. of cellulose in alpha portion}}{0.0124} + \frac{\text{wt. of pentosans in alpha portion}}{0.0220}}{\frac{\text{total wt. of cellulose in sample}}{0.0124} + \frac{\text{total wt. of pentosans in sample}}{0.0220}} = \frac{\text{volumetric alpha per cent}}{100},$$

the following expression for the percentage of the total pentosans remaining with the alpha portion can be derived:

$x = (229/p)\ [(g - v) + v]$
x = percentage of total pentosans remaining with the alpha portion
p = total pentosans in sample, per cent
g = gravimetric alpha-cellulose value (table 2, column 2)
v = volumetric alpha-cellulose value (table 2, column 3).

Substituting the corresponding data in this expression it is calculated that 79.8, 72.8, and 96.6 per cent of the pentosans in the pulps 1039, 1018, and 988, respectively, remain in the alpha-cellulose portion. It is seen that these values for "alpha pentosans" are of the same order of magnitude as the values for alpha cellulose in the pulps. It may, of course, be argued that the difference between g and v is not significant, that perfect agreement between the gravimetric and volumetric results would be obtained if certain mechanical differences of treatment could be eliminated. In that case, $g - v = 0$ and $x = v$, that is, the pentosans are distributed between the alpha and the beta plus gamma portions exactly as in the cellulose.

It was of interest to ascertain the precision of the method when unusually small samples are taken for analysis. Therefore, 0.03-g. samples, corresponding to a piece of paper the size of an ordinary postage stamp, were taken of the materials 1035, 1039, and 1018. The process for separating the cellulose fractions was the same as above, except that a Schott fritted glass filtering crucible, no. 3, was used. The oxidimetric solutions used above were diluted tenfold for these experiments. The results obtained for the alpha-cellulose values for these 0.03-g. samples were 94.2, 85.6, and 77.0 per cent, respectively. It is seen that these values are in fair agreement with the corresponding ones listed in Table II. The writer believes that the precision when a 0.03-g. sample is used could be increased by the use of a larger ratio of the volume of alkali to the weight of sample.

Volumetric Results for Beta and Gamma Cellulose

The gravimetric determination of beta cellulose is usually extremely difficult and time consuming. Beta cellulose precipitates upon acidification of the filtrate from the alpha cellulose, as a very gelatinous substance. It clogs the pores of all filters, and usually requires from 2 to 4 hours for its separation. For that reason the directions [4, 9] [28] advise coagulating the precipitate by boiling and filtering hot, followed by washing with hot water.

The boiling procedure, however, yields results which differ from those obtained when the separation is made at "room temperature", since the solubility of beta cellulose is rather strongly influenced by temperature. This is shown by experiments in which the gamma portions of acidified equal parts (1/10) of a beta+gamma filtrate from a 1-g. sample of 1018 soda pulp were removed at various temperatures. After a mixture had been kept at a given temperature for several hours, with frequent stirring, the beta cellulose was allowed to settle at that temperature, and a definite part of the supernatant liquid was removed and analyzed volumetrically for dissolved cellulose. The results are listed in Table III. If a system in which the beta cellulose has been "coagulated" by heating to 100 deg. C is allowed to cool, additional beta cellulose will precipitate.

Obviously, the beta cellulose should not be removed from the hot solution or washed with hot water if it is desired to obtain a measure of the cellulose, which simply precipitates upon acidification of the filtrate from the alpha cellulose. If the separation is made at room temperature, however, very little beta cellulose will be in the acidified solution. This can be seen simply by plotting temperature against beta cellulose content, using the data of Table III.

TABLE III.—EFFECT OF TEMPERATURE ON THE SOLUBILITY OF BETA CELLULOSE

Temperature Deg. C.	Volume of dichromate for gamma portion Milliliters	Apparent gamma cellulose Per cent	Beta cellulose Per cent
20	0.31	3.4	18.4
60	.36	3.9	17.9
80	.43	4.7	17.1
100	.55	6.0	15.8

The extent to which the filtrate is acidified, implied in some methods as being of consequence, was found to have no appreciable effect upon the amount of beta cellulose precipitating, and, therefore, no appreciable effect upon the gamma-cellulose content over a very wide range

[28] The method of Lewis and Browning gave the values 90.4% and 77.4% for pulps 988 and 1018, respectively.
[28] See footnote (a) in Table I.

TABLE IV.—VOLUMETRIC RESULTS OF THE BETA- AND GAMMA-CELLULOSE DETERMINATIONS

Materials	Gamma cellulose dichromate values cc.	Gamma cellulose Per cent	Beta cellulose Per cent
1035 (rag paper)	0.26	1.3	3.8
	.27	1.3	3.9
	.25	1.2	3.8
	.26	1.3	3.8
Average	...	1.3	3.8
1009 (no. 1 old white rags)	0.30	1.3	8.1
	.33	1.5	8.1
	.32	1.4	8.5
	.39	1.7	7.8
Average	...	1.5	8.1
1039 (refined sulphate pulp)	2.50	11.4	4.7
	2.37	10.8	5.0
	2.42	11.0	4.8
	2.54	11.6	4.2
Average	...	11.2	4.7
1018 (soda pulp)	0.67	3.0	18.4
	.72	3.3	18.4
	.68	3.1	19.4
	.72	3.3	18.1
Average	...	3.2	18.6
988 (refined sulphite pulp)	0.98	4.4	5.1
	1.03	4.6	4.8
	1.03	4.6	4.9
	1.01	4.6	4.8
Average	...	4.6	4.9
1008 (no. 1 new white rags)	0.16	0.7	3.3
	.20	.9	2.8
	.22	1.0	2.7
	.22	1.0	2.8
Average	...	0.9	2.9

(acidity=10^{-6} N to 3N). An amount of acid is, therefore, added which is known to be in excess of the base present, thereby avoiding the use of an indicator or of acetic acid, both of which were found to introduce large errors by reduction of dichromate. The values for the beta and gamma cellulose in the materials listed in Table II are shown in Table IV. The calculations were carried out as previously described.

Literature Cited

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(7) Porrvik, *Papier-Fabr.* 26: 81 (1928).
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TAPPI Delaware Valley Section Discusses Impregnating Papers

The Delaware Valley Section of the Technical Association of the Pulp and Paper Industry met at the Engineer's Club on Friday Evening, May 21, 1937, for the usual informal dinner, after which there were two speakers.

The first speaker was Robert B. Rohrer, assistant technical director of the Armstrong Cork Company, Lancaster, Pa., who discussed the impregnation of felt papers with non-aqueous liquids, specifically asphalts. The principal papers that are so impregnated are roofing felt and floor covering.

The requirement of roofing felt is protection against weather. Floor coverings are usually coated on both sides, must be resistant to abrasion and have a cushioning effect. They must have a minimum of bleeding and must not stain, and they should have smoothness. Both should be highly resistant to tear and have uniform formation, free from cockles, waviness and highly absorptive and must be flat on the surface to which they are applied.

For felts, rags constitute the main raw material. They are received in various conditions. No. 1 rags should be largely wool, No. 2 grade is of cotton. Rayon when present, is of no value.

In making felt the first step is cutting the rags. This half stock is passed on to beaters (mostly batch type). Brushing rather than cutting in the beater is desired. They then get a brushing in jordans. Finally they go to single cylinder machines. The product is dried to 5 per cent or less to prevent asphalt foaming later. They get one or two nips in a calender stack.

Saturation is accomplished by spraying asphalt on two sides, followed by passing through an asphalt bath. It may also be saturated entirely in a bath. The temperature of the bath varies from 250-400 deg. F. depending on the character of asphalt. One side is eventually coated with pebbles, mica, etc. the other side with asphalt.

Flooring is coated with paints (oil, casein, etc). The felt must be cooled before coating.

The felt characteristics vary from 0.050-0.100 inch. It usually weighs a pound per point (480 sq. ft. of 0.050 inch will weigh 50 pounds).

The asphalt requirements are as follows: It must be stable under ordinary temperature; have a low viscosity of the saturating temperature.

In roofing about 200 per cent asphalt is added. Flooring usually takes about 120 per cent of weight for saturating. The products are not waterproof since considerable water can be absorbed. It does, however, retard the rate of water absorption.

A new use for felt is in absorbing heat and vibration in turret top automobiles. This is loose-texture felt that is saturated with a lower melting asphaltic material. Its thickness is about .100 inch. Another use is for shoe products (box toes to retain the shape of toe of the shoe). A third type of material is a floor covering not impregnated with asphalt but with a paint (krafelt).

Latex Papers

The next speaker was M. J. Vittengl, Plant Manager of Vinton Mills, E. I. DuPont de Nemours & Co., Brattleboro, Vt., who discussed the impregnation of absorbent papers with aqueous solutions and dispersions, specifically rubber latex.

Latex is obtained from the bark of the rubber tree. Rubber in latex is pear shaped and is a discrete aqueous solution. The particles are of different sizes.

Rubber latex is easily oxidized and becomes brittle. Copper and manganese have a deleterious effect on latex and must be left out of equipment that comes in contact with latex. Patents relating to latex treated paper go back even prior to 1830. The real advance, however, has been quite recent. By 1850 the stabilization of latex

with ammonia was discovered. The first American patent came out in 1868. In 1924 Kaye added latex to paper fibers in beaters. In 1934 Norbach received a patent for saturating paper with latex by means of squeeze rolls. In this case the paper web is wet.

The paper must be porous and bulky. Kraft paper and other hard fibers can not be impregnated with latex by the dry sheet impregnation method. Celplia and similar pulps are used. In the wet web process any fiber can be used. The wet web process is more efficient than the dry web on the beater process.

Election of Officers

The following were elected as officers of the Delaware Valley Section of TAPPI: Chairman, J. d'A. Clark, Scott Paper Company, Chester, Pa.; Vice Chairman, C. M. Connor, Valley Forge Laboratories, W. Conshohocken, Pa.; Secretary-Treasurer, J. R. Atwater, Dill & Collins Inc., Philadelphia, Pa.; Executive Committee: S. D. Reynolds, Container Corporation of America, Manayunk, Pa.; and H. C. Schwalbe, Dill & Collins Inc., Philadelphia, Pa.

Those Who Attended

Among those present were the following: H. C. Speel, Atlas Powder Company, Wilmington, Del.; A. E. Griffin, American Cyanamid and Chemical Company, Philadelphia; Ralph Mair, Krebs Pigment and Color Corporation, Newport, Del.; Heikki Sihtola, A. Ahlstrom Company, Finland; J. Carl Schmidt, Du Pont Company, Philadelphia; H. B. Preble, Congoleum-Nairn Inc., Cedarhurst, Md.; W. D. Harrison, Riegel Paper Corporation, Milford, N. J.; Miss R. M. Cobb, Lowe Paper Company, Ridgefield, N. J.; E. F. Cayo, Philadelphia; G. J. Lane, Edgar Brothers Company, Metuchen, N. J.; Richard Almy, Armstrong Cork Company, Fulton, N. Y.; F. W. Varden, Barber Company, Philadelphia; G. F. Corse, Dill and Collins Inc., Philadelphia; W. M. Shoemaker, National Vulcanized Fibre Company, Yorklyn, Del.; Russell Morehouse, Philadelphia Quartz Company, Philadelphia; W. P. Quinn, Container Corporation of America, Philadelphia; G. Daggett, Riegel Paper Corporation, Milford, N. J.; H. F. Hoffmann, General Dyestuff Corporation, Philadelphia; J. A. From, Atlas Powder Company, Wilmington, Del.; R. I. Bashford, same company; Leslie Justice, Valley Forge Laboratories, Conshohocken, Pa.; Leonard Edwards, Riegel Paper Corporation, Milford, N. J., G. B. Martin, General Dyestuff Corporation, Philadelphia; E. W. Wells, Container Corporation of America, Manayunk, Pa.; M. Craig Maxwell, McDowell Paper Mills, Manayunk; Sidney Hausman, Congoleum-Nairn Inc., Cedarhurst, Md.; W. E. Brow, Container Corporation of America, Manayunk; W. J. Irwin Jr., Congoleum-Nairn Inc., Cedarhurst, Md.; L. E. Smith, Downingtown Manufacturing Company, Downingtown, Pa.; R. E. Bare, Elk Paper Manufacturing Company, Childs, Md.; G. L. Schwartz, Dupont Experimental Sta., Wilmington, Del.; J. N. Tuttle, Glassine Paper Company, Monroe Bridge, Mass.; C. R. Smith, Waterbury, Conn.; C. G. Albert, Edgar Brothers Company, Metuchen, N. J.; C. C. Stewart, C. C. Stewart Paper Company, Philadelphia; C. C. Shubert, Dill and Collins Inc., Philadelphia; J. d'A. Clark, Scott Paper Company, Chester, Pa.; I. G. Ross, Upson Company, Lockport, N. Y.; J. H. Fritz, National Oil Products Company, Harrison, N. J.; S. M. Bratton, Pusey & Jones Corporation, Wilmington, Del.; E. F. Anderton, Scott Paper Company, Chester, Pa.; Paul Hodges, Scott Paper Company, Chester, Pa.; R. M. Bates, Thos. M. Royal & Company, Philadelphia; R. G. Macdonald, Secretary of TAPPI; A. McInnes Jr., Pusey & Jones Corporation, Wilmington; C. M. Connor, Valley Forge Laboratories, Conshohocken, Pa.; C. M. Dann, Krebs Pigment and Color Corporation, Newport, Del.; Charles McDowell, McDowell Paper Mills, Manayunk; F. J. McAndrews, same company; C. W. Rivise, Caesar & Rivise, Philadelphia; S. F. von Koch, C. C. Stewart Paper Company, Philadelphia; J. F. Ohlson, Continental Diamond Fibre Company, Bridgeport, Pa.

Research on Preservation of Records

The results of further studies made as a part of its effort to obtain comprehensive information on the preservation of records, are summarized by the National Bureau of Standards in a revised edition of its general summary report of this research, prepared by A. E. Kimberly and B. W. Scribner.

Because of the rapidly growing use of motion picture films as a means of reproducing record material, either as a preservative measure or for more general accessibility, the research was extended to a study of the stability and optimum storage conditions of films. Both the acetate and the nitrate films were studied. The former was found to be a stable material but information on the resistance of the emulsion to wear and other influences is incomplete. The nitrate film showed a comparatively short life, but information was developed on the most suitable conditions for maximum longevity in storage and use of both this and the acetate type. The study was made possible by the financial support of the Carnegie Foundation and the National Archives. The latter also supported an investigation to determine whether certain fumigants could be used to rid documentary material of insect life without injuring the material, because all incoming material is treated in fumigating chambers before it goes to the storage stacks. All of the fumigants studied were found to be harmless to paper.

Some revision has also been made in the summaries of the previous studies. These studies were initiated by a survey of the relation of conditions of storage in libraries to the condition of stored documentary material. The results indicate that light, temperature and the humidity and purity of the air, are conditions which need careful control to minimize deterioration of stored material. Air acidified by sulphur dioxide from the cumbustion of fuels was found to be deteriorative to material stored in libraries of congested areas, but it was proved by investigation in the Folger Shakespeare Library that library air can be completely cleansed of this deteriorative gas. As a result of these studies, it is recommended that good library practice should include the use of diffused illumination, and as little of it as possible, and the use of an air conditioning system for the maintenance of moderate temperature and humidity and the removal of acidic gases from the air.

Tests of hundreds of modern papers, and papers from old books and newspapers, showed the necessity of careful choice of paper for permanent record use, and that the choice should be based on the purity of the fiber, rather than its source, and on the purity of the paper in other respects. Protective coatings for papers were also given attention, and both transparent cellulose sheeting and Japanese tissue papers were found suitable.

Writing ink was known to be more or less deteriorative to paper. More exact information on this was obtained, which showed that the ordinary type of ink is distinctly deteriorative to all types of record papers. But the results of study of a special type of ink proposed by other investigators indicated that it might be used without harmful effect.

Copies of the report, Miscellaneous Publication 154, can be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for ten cents.

Instrumentation Studies. XIV

A Comparison of the Smith-Taber and the Gurley Stiffness Testers

By The Staff of The Institute of Paper Chemistry

The stiffness (in milligrams) of a strip of paper is measured by the following relation:

$$\text{Stiffness} = S = \frac{ET^3}{12} \cdot \frac{W}{L^3},$$

where

L = length of sample under test, which is measured from edge of clamping device to the point of application of the force;
W = width of paper strip;
T = thickness of paper; and
E = Young's modulus = stress/strain in the direction of axis of test strip.

To see the connection between the Gurley and the Smith-Taber testers, it is necessary to realize that in both machines one measures the force necessary to produce a given deflection of the free end of the paper under bending. The mechanics of the measurement resolves itself to the problem of the bending of an elastic beam fixed at one end, with a concentrated load at the free end.

The deflection of the free end of the papers shown in Fig. I is equal to Y and is given by the following relation:

$$Y = \frac{PL^3}{3\frac{WT^3}{12}E}, \qquad (1)$$

where Y and P are defined in Fig. I.

For the case of the Gurley tester, assuming that the angle of contact of pointer and paper remains constant, then

$$P = KW_G \sin \Theta_G, \text{ where } K = N/M \sin[90 - (\Theta + \Theta_G)],$$

the subscript G designating the Gurley apparatus.

Substituting P as defined in equation (1), there results the following equation:

$$KW_G \sin \Theta_G = \frac{3}{12} ET^3 \times \frac{Y}{L} \times \frac{W}{L^3} \text{ (mg.)} \qquad (2)$$

For papers sufficiently long Y/L remains constant.

KW_G is the sensitivity of the instrument. The actual reading on the instrument is proportional to $\sin \Theta_G$ and is R_G.

$$\therefore S_{\text{Gurley}} = K'W_G \times R_G = \frac{3}{12} ET^3 \times \frac{Y}{L} \times \frac{W}{L^3} \qquad (3)$$

For the Smith-Taber instrument the following relation holds:

$$S_{ST} = K'_{ST}W_{ST} \times R_{ST} = \frac{3}{12} ET^3 \times \frac{Y}{L} \times \frac{W}{L^3} \qquad (4)$$

the subscript ST designating the Smith-Taber apparatus.

Since the right hand sides of equations (3) and (4) are equal, it seems that, for the samples of the same length and width, the same physical quantity is measured by both the Smith-Taber and the Gurley testers.

Accuracy

Samples of the same length and width were tested on both the Smith-Taber and the Gurley machines. The range covered was from 1000 to 10 stiffness units at four points. The results are given in Table I.

TABLE I

Range	Smith-Taber % Mean Deviation	Gurley % Mean Deviation
1000	4%	2%
300	4%	2%
100	2%	2%
10	2%	1%

The accuracy is determined in terms of the *per cent mean deviation* expressed in percentage of the actual reading. In both instruments the accuracy is determined by the magnitude of the reading and the size of the scale unit and the pointer.

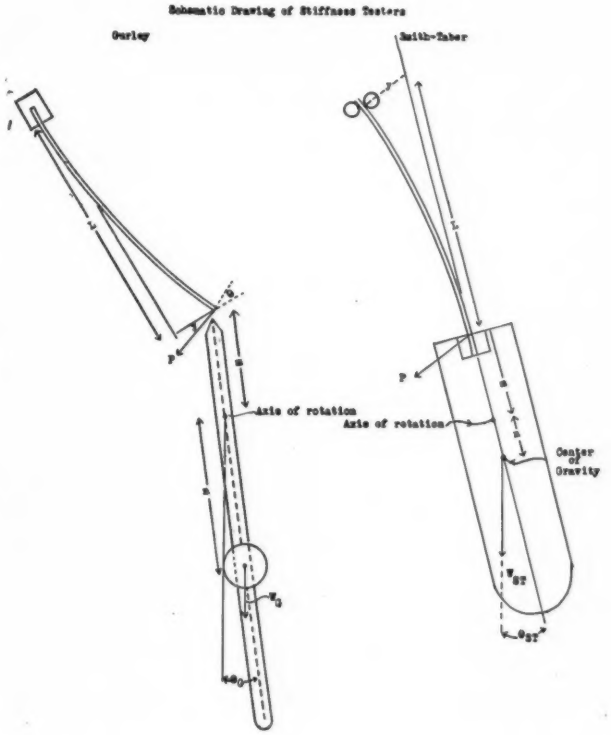
Errors due to the rough or poorly cut sample which arise in the Gurley tester do not occur in the Smith-Taber tester. The reason for this difference is simply the fact that one applies the pressure to the free end of the sample by contact with a cylinder approximately one-quarter inch from the end of the sample.

In either instrument five readings should be taken with and against the curl, and the average of the sum of these readings is to be quoted as R_G or R_{ST}.

Either instrument is sufficiently accurate for control tests within a limit of 5 per cent at the outside for the Smith-Taber and of 3 per cent for the Gurley.

Ease of Operation

It was found to be more difficult to determine the end-point on the Smith-Taber instrument than on the Gurley. This is due to difference in the two manual controls. Due to the friction on the mounting of the indicator in the Smith-Taber tester, an impulse is often given to the paper which starts the swinging element oscillating, thereby making the end-point uncertain. It was also more difficult to produce a slow, continuous motion on the Smith-Taber than on the Gurley instrument. This was due to the fact that it was easier to control the angle of rotation of a wheel which was held in the hand, than it was to push a lever through a small arc.



Reproducibility

As seen from the paragraph on accuracy, the results are more reproducible on the Gurley tester than on the Smith-Taber. This reproducibility is materially affected by the use of a very stiff board or a soft, compressible paper.

Hence, it appears that a material increase in accuracy would be obtained by use of heavier loads and deflections through small angles when measuring heavy boards or fibers. This is essential in order to keep the paper bend below the yield point or the elastic limit of the sample. On board samples of stiffness 1000 units or more as measured on the Gurley tester, the reproducibility is influenced by the compression which is applied to the sample by the clamping device. For optimum results the sample should be clamped just tightly enough to prevent slip or pull-out of the sample.

On the Gurley instrument the main factors in decreasing reproducibility are the shape of the cut edge and the accuracy with which the sample is slipped in the clamp. With regard to alignment, the Smith-Taber tester has the advantage.

For the best reproducibility the end-point on both instruments should be approached sufficiently slowly to approximate a condition of static equilibrium of the sample. Results are reproducible only if the sum or the average of the readings with and against the curl be taken as R, the stiffness reading. The last point with regard to reproducibility is that samples should be handled as little as possible. Rough handling introduces moisture variables and creases and folds which materially alter the readings. Samples should be taken from a piece which has been under pressure for some time.

Sensitivity

The sensitivity or change in stiffness per unit change of scale for deflection is constant over the scale for any given load on the force-applying devices.

The Smith-Taber tester has two values for its different set-ups as follows:

2000 units scale $\dfrac{3000 \text{ mg.}}{\text{scale division}}$;

200 units scale $\dfrac{300 \text{ mg.}}{\text{scale division}}$.

The sensitivity of the Gurley instrument is for the case of the five gram weight in the first hole:

$$\frac{178 \text{ mg.}}{\text{scale division}}$$

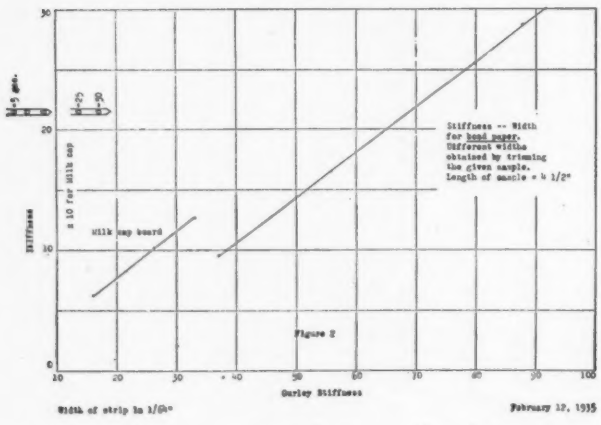

Stiffness -- Width for bond paper. Different widths obtained by trimming the given sample. Length of sample = 4 1/2"
Milk cap board
Figure 2
Gurley Stiffness
Width of strip in 1/8ths
February 12, 1935

FIG. 2

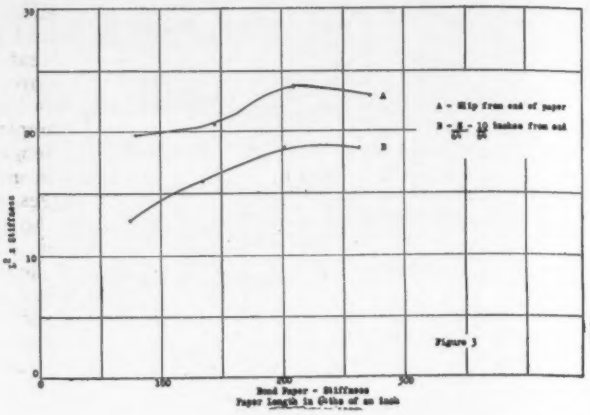


FIG. 3

The sensitivities are calculated for the sample of the dimensions 1 x 4 inches. The Gurley is very flexible as to adjustment of sensitivity. The above sensitivity of

$$\frac{178 \text{ mg.}}{\text{scale division}}$$

can be multiplied by any one of the following factors through adjustment of the weights provided.

1	2	4	5	7	9	10	11	12	14	20
21	22	24	25	30	40	41	42	45	50	51

This sensitivity can also be calculated from the relation:

$$\text{Sensitivity} = \frac{(W_1 \times 1 + W_2 \times 2 + W_3 \times 4)}{5},$$

where W_1 W_2, and W_3 are the weights in the first, second and third holes respectively,

$$\frac{\text{Maximum load}}{\text{Scale division}} = \frac{9{,}078 \text{ mg.}}{\text{Scale division}}$$

Hence, it is seen that taking of single samples of a given length and width, the Gurley instrument is the more useful one from the viewpoint of accuracy. This is due to the fact that it is possible to change the sensitivity factor and make the indicator readings large enough for accurate reading.

The sensitivity of both instruments is capable of being changed by using samples of different widths. This point is useful in obtaining stiffness of very rigid boards or cardboards. The proportionality between width and stiffness, as read on these instruments, has been checked, the curve of Fig. 2 indicating the results. It is therefore quite valid to cut a narrow strip of the sample and measure the stiffness and convert the reading to that of the standard sample. For the determination of the final reading about five of these narrow samples should be used as data.

The sensitivity may be changed by changing the length of the sample on the Gurley instrument but not on the Smith-Taber. It is assumed on the Gurley that the stiffness is inversely proportional to the square of the length, as may be seen from the formula:

$$KW_G \sin \Theta_G = \frac{3}{12} ET^3 \times \frac{Y}{L} \times \frac{W}{L^3} \quad .$$

This proportionality is true as a first approximation.

To test the validity of the conversion factors given in the Gurley instructions, samples of bond and of coated book papers of various lengths were measured. These lengths varied from 1.5 to 4.5 inches over-all length. If the stiffness (R_G) were inversely proportional to L^2, the square of the sample length, then $R_G L^2$ should be a constant. The experimental results are shown in Figs. 3 and

4. Were the proportionality true, then the points would lie on a horizontal line. The deviation increases with the coated book stock with decreasing length, while it decreases with the bond papers. From these results it is apparent that one cannot use the Gurley conversion factors for short lengths. Hence, it is recommended that samples on the Gurley instrument should be 3.5 inches in length or greater when it is desired to express the stiffness in mg.

The last point with regard to sensitivity is the suggested use of many sheets when measuring newsprint, bond, tissue, or other papers of low stiffness. This point was tested experimentally by measuring the stiffness of single strips of bond paper and then measuring the stiffness of the combinations of these papers. The results are shown in Fig. 5. These results indicate that it is a valid procedure to use many sheets of paper of low stiffness and then quote the

$$\frac{\text{stiffness of sum}}{\text{number of samples}} \quad ..$$

as the average stiffness per sheet. The limit of accuracy of this procedure is, at the outside, about 5 per cent.

Factors of Conversion of Smith-Taber Readings and of the Gurley Readings to a Common Basis of Milligrams for a Sample of 1" x 3" Dimensions

Smith-Taber:

Stiffness of standard sample =

$$S_{test} \times \left[\frac{L_{test}}{L_{standard}}\right]^2 \frac{W_{standard}}{W_{test}} \times 300,$$

or stiffness of standard sample = $S_{test} \times 355$ (ing.).

Gurley:

Stiffness of standard sample =

$$(S_{test} \times \frac{L^2_{test}}{W_{test}} \times 11.1) \text{ mg.},$$

where L = actual length in inches—½ inch.

When the scale reading of the Gurley is R_G, then the equation becomes: Stiffness standard sample

$$= R_G \frac{(W_1 \times 1 + W_2 \times 2 + W_3 \times 4)}{5} \times \frac{L^2_{test}}{W_{test}} \times 19.8,$$

where W_1, W_2, W_3 are the weights in grams in the first, second and third holes, respectively. Graphically illustrated, we have in Fig. 8

Using the sensitivities as quoted on the Gurley and Smith-Taber machines, the ratio of the stiffness of the test samples is found to be

$$\frac{\text{stiffness (Gurley)}}{\text{stiffness (Smith-Taber)}} = \frac{300}{150} = 2.00.$$

Samples 4.5 x 1.5 inches in size were run on both instruments to experimentally determine the conversion factor

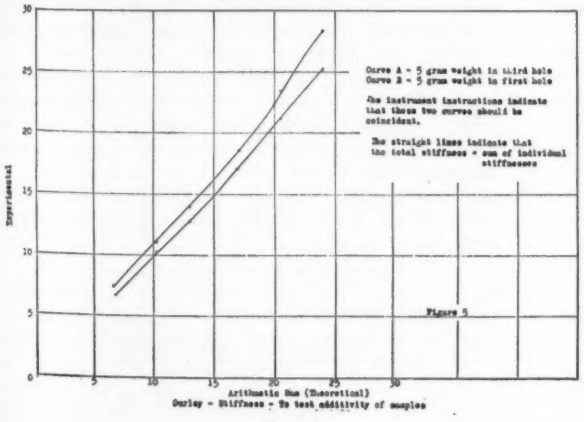

Curve A - 5 gram weight in third hole
Curve B - 5 gram weight in first hole
The instrument instructions indicate that these two curves should be coincident.
The straight lines indicate that the total stiffness = sum of individual stiffnesses
Figure 5
Experimental
Arithmetic Sum (Theoretical)
Gurley - Stiffness - By test additivity of samples

FIG. 5

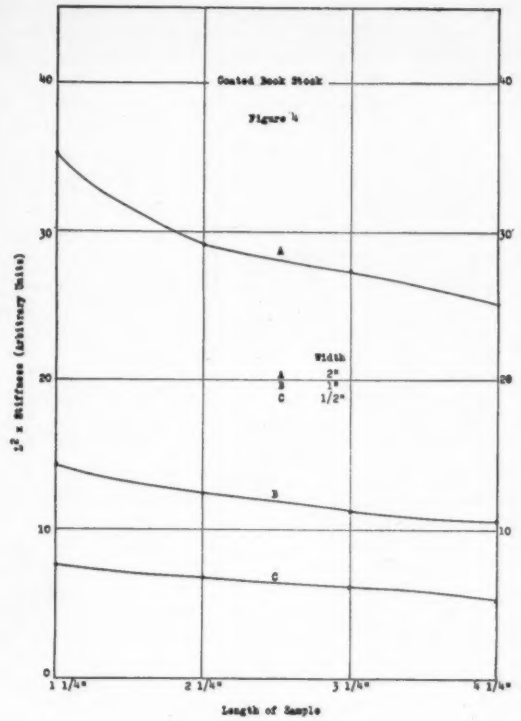


FIG. 4

from Smith-Taber to the Gurley. The results appear in table II.

TABLE II

Paper	Smith-Taber	Gurley	Size (inches)	$\frac{R_G}{R_{ST}}$
Milk cap	1060	1833	4.5×1.5	1.73
Suit box	340	602	4.5×1.5	1.77
Soft card	104	172	4.5×1.5	1.65
	105	169	4.5×1.5	1.61
Coated book cover	13.8	27.4	4.5×1.5	1.98

Omitting the coated book reading from the average, we have:

$$\frac{R_G}{R_{ST}} = 1.69 \pm 0.03 \text{ (experimental)}.$$

Using the sensitivities quoted on the Gurley and Smith-Taber machines, the ratio is as follows:

$$\frac{R_G}{R_{ST}} = 2.00.$$

The Ultra-Sensitive Attachment on the Smith-Taber Tester

It is said in the instructions given with the Smith-Taber

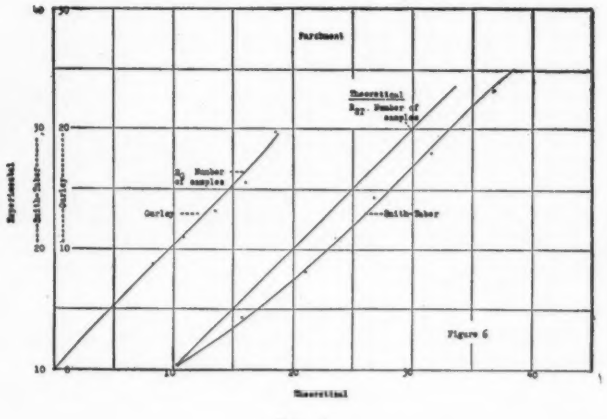


FIG. 6

tester that one uses a sample of the same width as ordinarily used, but of length determined by the fact that the loading clip is to *just clear* the guide of the attachment.

A fixed over-all length of paper of 3.25 inches was chosen as the standard length. The paper was clamped with the top flush with the clamp and the bottom pushed to the bottom of the loading clip. To test the reproducibility on a given sample the following results were obtained for the coated book sample.

TABLE III

D_l = deflection to left of zero point.
D_r = deflection to right of zero point.

	Reversed Sample		Reversed Clip		Again Reversed	
	D_l	D_r	D_l	D_r	D_l	D_r
	44.0	33.5	34.0	44.0	34.5	40.0	31.5	41.0
	44.0	32.0	33.0	43.5	35.0	41.0	32.0	41.0
	42.5	34.0	34.5	42.5	35.0	41.0	33.0	40.0
	43.0	34.5	34.0	42.5				
	41.5	34.0						
	43.5	34.0						
Av. ...	43.1	33.7	33.8	43.1	34.8	40.6	32.3	40.6
Sum ..	76.8		76.9		75.4		72.9	

The values of the last two columns indicate the variations which arise on handling the paper and changing the clamp.

To check the possibility of obtaining the stiffness of a paper of low stiffness by using a large number of samples for the measurement, seven samples of vegetable parchment were individually measured. Then the readings for two up to seven samples used simultaneously were taken. The results appear in the Table IV.

TABLE IV

Smith-Taber—Ultra Sensitive Parchment Papers

Seven samples 1, 2, 3, 4, 5, 6, 7 were used.

	Theoretical	Experimental
1 + 2 + 3 + 4 + 5 + 6 + 7	36.55	33.6
1 + 2 + 3 + 4 + 5 + 6	31.45	28.0
1 + 2 + 3 + 4 + 5	26.50	24.5
1 + 2 + 3 + 4	20.95	18.1
1 + 2 + 3	15.75	14.1
1 + 2	10.30	10.3

Gurley

	Theoretical	Experimental
1 + 2 + 3 + 4 + 5 + 6 + 7	18.55	19.8
1 + 2 + 3 + 4 + 5 + 6	16.00	16.5
1 + 2 + 3 + 4 + 5	13.25	13.6
1 + 2 + 3 + 4	10.70	11.26
1 + 2 + 3	8.20	8.46
1 + 2	5.10	5.10

These results appear graphically in Fig. 6.

It appears that the Gurley results are much more favorable to the calculation of stiffness from the average of a large number of strips simultaneously measured.

The Smith-Taber sensitive scale is supposedly to be divided by 10 to express the results on the same scale as

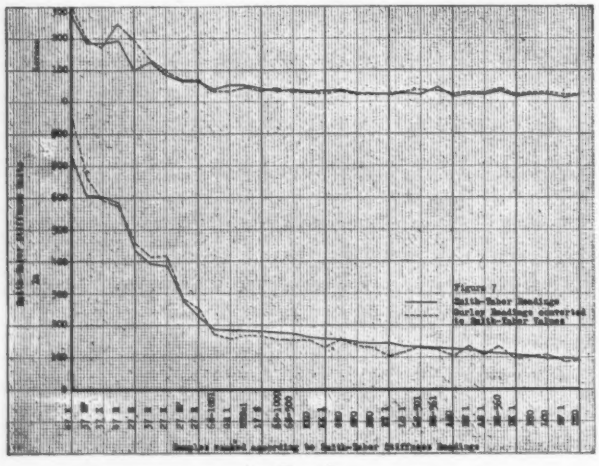


FIG. 7

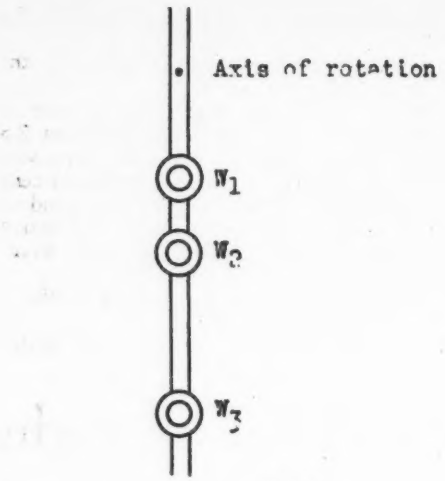


FIG. 8

with the regular set-up. To check this point and to check the linearity of the sensitive scale the following measurements were made.

TABLE V

Paper	Smith-Taber	Gurley	Ratio
Book	11.7	44.4	3.79
Bond	1.9	5.07	2.66
Toweling	1.1	2.55	2.32
Newsprint	.88	2.3	2.61

It is seen from this table that there is a correlation between the Smith-Taber and the Gurley lowest stiffness values. However, above this point deviations begin, as is seen from the results of the readings on the coated book stock. Applying the factor of the relative lengths of the samples measured to those measured with the loads, the Gurley/Smith-Taber ratio is 1.4 rather than 1.68 with the regular scale. If one assumes the Gurley scale to remain correct, then it appears that the Smith-Taber scale is not linear when using the ultra-sensitive attachment.

Summary

The same measure of stiffness is used in both the Smith-Taber and the Gurley stiffness testers. This measure of stiffness is the force in milligrams which must be applied to the free end of the paper sample in order to produce a specified bending. Consequently, the stiffness readings in the Smith-Taber tester can be converted to Gurley stiffness readings.

It appears that results are more reproducible on the Gurley instrument than on the Smith-Taber. In order to obtain reproducibility of results, it is necessary to quote the sums of the instrumental readings for "with" and "against" the curl of the sample. For optimum reproducibility, the end-points of the readings should be approached slowly. As a further precaution, samples should be handled as little as possible. Samples of paper boards should be clamped just firmly enough to prevent slipping or pull-out of the sample from the clamping device.

The sensitivity of the Gurley instrument can be varied over a larger range than on the Smith-Taber instrument. The sensitivity can be changed in 23 different ways on the Gurley by a combination of the available loads, while there are only three possibilities on the Smith-Taber. The range of both instruments may be extended by using samples of different widths in addition to the simultaneous measurement of more than one sample. Still another possibility is the use of samples of different lengths on the Gurley instrument.

Data were obtained to check these points with the following results:

1. Stiffness readings are directly proportional to the width of the sample.
2. Stiffness readings vary inversely as the square of the length of the sample for samples longer than 2.5 inches. The Gurley conversion factors which are sent with the instrument are in error by as much as 40 per cent for samples shorter than 2.5 inches. The errors depend on the type of paper measured. Hence, consistent correction factors for the tabulated conversion factors are not available.
3. More than five samples of paper of low stiffness should not be simultaneously measured.
4. The conversion factors for the Gurley and Smith-Taber stiffness readings to a common basis of milligrams for a sample of one by three inches are given. The experimental verification for these conversion factors is shown by the curves in Fig. 7. The data include results of 32 different samples of paper board for both machine and cross direction.

The average of five readings should be taken for accurate results. The outside limit of reproducibility is 5 per cent for the Smith-Taber instrument and 3 per cent for the Gurley instrument.

The Smith-Taber instructions for use of the "ultra-sensitive" attachment indicate that the regular scale readings should be divided by 10. Experimental data for very low stiffnesses indicate that the factor would better be 12.

Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Pulp-Purification

Phenomena Observed in the Treatment of Wood Pulp and Various Salt Solutions. D. N. Lektorskii. Lesokhim. Prom. 4, No. 10:8-13; No. 11:9-12 (1935); C. A. 30:8608.—The true fixation of the metals in the pulp of the wood blocks is not affected by the treating methods or by the ionic concentration of the solutions. The cation displaces completely or partially the ash ingredients, which are removed from the pulp by washing. The selective sorption of the cation occurs in the treatment of sawdust with hot solutions (copper sulphate, ferric alum). The sorption of the cation by birch sawdust takes place from a cold copper sulphate solution at a concentration less than $1.78N$, and the sorption of the solvent occurs at a concentration higher than $1.78N$. Some of the metal remains in the pulp in an unknown combination. The amount of the fixed metal is greater on hot treatment than on cold. Wood pulp containing a small amount of tanning substances fixes almost an equivalent amount of the metal, and that rich in tanning substances fixes a much greater amount. The fixation of metals from cold solutions is explained by methathesis with ash ingredients and by addition reaction with extractable substances.—C.J.W.

Sorption of Water Vapor by Paper Making Materials. Effect of Physical and Chemical Processing. C. O. Seborg, F. A. Simmonds and P. K. Baird. Ind. Eng. Chem. 28:1245-1250 (Nov., 1936).—The average equilibrium moisture content of representative unbleached chemical wood pulps at various relative humidities increased approximately 6 per cent as a result of severe beating. Bleaching with calcium hypochlorite decreased the hygroscopicity of the sulphite pulps used.—A.P.-C.

Purifying Pulp. Brown Co. Brit. pat. 448,582 (June 11, 1936).—Sheets, etc., of sulphite or other chemical pulp are purified, suitably in a steeping press, with caustic soda, etc., too hot to produce mercerization, e.g., 10 per cent or more at 50° C. or higher for 1 hr., and washed with hot water which may contain sulphur dioxide, and may be sheeted before being dried. The pulp, which may first be treated with hot dilute alkali, such as slaked lime, soda ash, sodium sulphide, etc., to which may be added soap, red oil, etc., may be purified to have a 96 per cent alpha-cellulose content.—A.P.-C.

Process for Improving Unbleached Impure or Semi-chemical Pulps. Umberto Pomilio. Fr. pat. 802,716. —The pulp is shredded, treated moist with cold chlorine gas, optionally washed with water, washed with a dilute alkaline or bisulphite solution to remove chlorinated products, washed with water oxidized with hypochlorite or other oxidizing agent, and washed.—A.P.-C.

Pulp and Paper Testing

The New Penetration Tester. Joseph Hammond. PAPER TRADE J. 103, No. 21:37-39 (Nov. 19, 1936).—this is a new type of instrument for the determination of sizing in paper which in some respects is an extension of the method followed in the flotation and dry indicator tests. The principle and operation are described and typical curves obtained with the instrument are given and discussed to show the significance of the results.—A.P.-C.

The Currier Size Tester. F. D. Broadbent, C. Brown and H. A. Harrison, PAPER TRADE J. 103; No. 19:32-35 (Nov. 5, 1936).—The instrument and the precautions which should be taken in using it are briefly described. A comparison of the results given by this instrument and by the "dry indicator" size test showed that the former consistently gives lower results, which is attributed to: (1) the slight pressure in the Currier test which enables "skin" resistance to be more easily overcome, and (2) the fact that the presence of penetrated moisture is detected more quickly. A study was made of the variable of the test.—A.P.-C.

Recent Progress on Color Problems in the Paper Industry. Lester C. Lewis. PAPER TRADE J. 103; No. 22:43-50 (Nov. 26, 1936).—A review and discussion of recent developments and progress in the application of spectrophotometry and the theories of light in diffusing media to the solution of paper making problems.—A.P.-C.

Reducing Color to Black and White. D. K. Donovan.

Paper Industry 18:663-664 (Nov., 1936).—A brief description of the operation of the recording photoelectric spectrophotometer and of its merits.—A.P.-C.

Rot in Roofing Felts. F. Peters. Vedag-Buch, Berlin, 1935:119-124; Building Sci. Abstr. 9:164.—Laboratory investigations of the vulnerability of impregnated roofing felts to attack by *Coniophora cerebella* has shown that impregnation with coal tar pitch is a completely satisfactory deterrent to attack, while asphaltic bitumen is much less effective.—C.J.W.

Testing the Resistance of Roofing Felts to Weathering. W. Weisswanger. Vedag-Buch, Berlin, 1935:148-159; Building Sci. Abstr. 9:164.—A brief, illustrated, accurate account of the materials and methods employed, the meterological conditions and the results observed in the course of a study, commenced in 1932, of the behavior of four different roofing felts during service on roofs.—C.J.W.

Printer and Paper

Why Paper? Cyrus S. Kauffman. Am. Printer 103, No. 4:28-29 (Oct., 1936).—The author emphasizes the importance of analyzing the characteristics or use requirements of paper from the viewpoint of the ultimate use of the printed piece before selecting paper for a special purpose. He illustrates his remarks by a practical example, namely selecting bond paper for a loose-leaf catalog.—C.J.W.

Choosing the Right Paper. W. B. Wheelright. Paper and Printing Digest, Oct., 1936:3-10.—Quality in paper is dependent upon its suitability for the given purpose. The printer, cooperating with the paper manufacturer and the buyer of printing, is the most competent man to choose the correct paper. Factors to be considered from the standpoint of intended use are expense, durability, finish, formation, opacity, and permanence. For the technical requirements of the printing process we consider the type of printing and type of press, illustrations used with their fineness, after-treatment (as varnishing), and binding. The uses of M. F., E. F., super, antique, eggshell, dull coated, and enamel book papers are discussed with regard to the above factors.—C.J.W.

Paper Specialities

Process for the Manufacture of Lightweight Opaque Papers, Particularly Writing and Printing Papers. Société Anonyme des Anciens Establissements Braunstein Frères. Fr. pat. 802,839.—There is incorporated into the furnish a substance capable of liberating stearic acid (suitably sodium stearate), an acid capable of liberating free stearic acid (suitably oxalic acid), size, alum and a filler.—A.P.-C.

Method for Combining and Winding Two or More Webs of Flexible Material. Robert McC. Johnstone, assignor to Cameron Machine Co. U. S. pat. 2,057,029 (Oct. 13, 1936).—Two webs are wound together in overlapping relation along one edge. A heat-responsive adhesive is applied to one of the webs along the overlapping portion and heating elements are pressed against the overlapping portions of both webs.—A.P.-C.

Paper Glazing. Walter E. Brown, assignor to Wyomissing Glazed Paper Co. U. S. pat. 2,057,081 (Oct. 13, 1936).—The invention provides improvements in the pressure tensioning of the reciprocated radius-bar polisher and in the construction and mounting of the paper-supporting bed of Hallman's paper glazing machine (U. S. pat. 1,357,234 of Nov. 2, 1920). The improvements enable the machine to be operated at higher speeds and produce sheets of uniform color and thickness throughout their entire width.—A.P.-C.

Production of Coated Creped Paper. Edward H. Angier. U. S. pat. 2,061,748 (Nov. 24, 1936).—Paper to be creped is treated with a solution or emulsion of rubber while in intimate contact with the creping roll, is removed from the roll by means of a creping doctor, and dried.—A.P.-C.

Gummed Tape. William W. McLaurin. U. S. pat. 2,057,042 (Oct. 13, 1936).—A strip of fabric is led through a heated bath of waterproof adhesive, and on emerging therefrom a strip of paper is applied on one side, the combined strip is passed between press rolls and around a cooling drum.—A.P.-C.

Miscellaneous

Latex Papers. Maurice Déribéré. Papier 39: 775-782 (Sept., 1936).—A review of the development of the Kaye process.—A. P.-C.

Cellulose Sponges. Jacques Lagelez. Papeterie 58: 873-874) Oct. 10, 1936).—A brief description of the manufacture and merits of viscose sponges.—A. P.-C.

Parchment and Its Uses. Lucien M. C. Champsaur. Fr. pat. 800,648 (July 15, 1936).—A treating bath such as acid is caused to act on paper of such a thickness that the transformation to parchment takes place only through a fraction of the thickness of the paper, and this treatment is followed by a cleavage, so that two sheets of paper are obtained, each of which is parchmentized on only one face. The other face retains to a great extent its absorbent properties and so may be glued to any surface such as leather.—A. P.-C.

Cellulose of Cellulose Hydrate Articles. I. G. Farbenindustrie Aktiengesellschaft. Fr. pat. 799,524 (June 16, 1936).—The tendency to swell of articles made from cellulose or cellulose hydrate is reduced by applying to the articles the component of urea—or thiourea-formaldehyde resins, and also two kinds of substances, one of which contains at least one free hydroxyl group and has at least one other group capable of reacting (ethylene glycol, ethylene di- or poly-glycol, glycerol or its monalkyl or -aryl ethers, alphamono- or alpha-beta-di-chlorohydrin, esters of phthalic, succinic, adipic, tartaric or benzonic acids) and the other is capable of reacting with the first (alcholates, phenols, phenolates, organic sulphonic acids, organic acid chlorides, anhydrides or salts), and condensing and polymerizing.—A. P.-C.

Treating Paper. Société pour l'Industrie Chimique á Bâle. Fr. pat 46, 559 (July 10, 1936). Addition to Fr. pat. 772,538.—Paper and like products are softened by treating them with mixtures comprising the products described in Fr. pat. 772,538 along with substances capable of preventing precipitation of calcium soaps in hard water, e.g., highly sulphonated oils, esters of aromatic sulphodicarboxylic acids with alcohols of high molecular weights, sulphonic acid of benzimidazoles, sulphuric esters of higher alcohols, etc.—A.P.-C.

New England TAPPI Meets

The meeting of the New England Section of TAPPI was held at the Hotel Bancroft, Worcester, Mass., on Friday evening, May 21, 1937. Dinner was at 7:00 P. M. followed by the business meeting at 8:30 P. M. Chairman, John B. Calkin, Dennison Manufacturing Company, Framingham, Mass., presided.

C. G. Weber of the Paper Section of the Bureau of Standards, Washington, D. C., was the guest speaker. An interesting discussion followed Mr. Weber's paper.

Imports of Paper and Paper Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports, of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

NEW YORK IMPORTS

WEEK ENDING MAY 22, 1937

SUMMARY

Wall paper .....22 bxs., 5 bls., 10 cs.
Paper hangings .....21 bls., 6 cs.
Newsprint .....7,963 rolls
Printing paper .....107 rolls, 26 cs.
Wrapping paper .....58 bls., 1,379 rolls, 46 cs.
Packing paper .....20 cs.
Drawing paper ..... 7 cs.
Filter paper .....19 cs.
Filter mass ..... 1 cs.
Filter compound .....50 bls.
Surface coated paper ..... 128 cs.
Metal coated paper ..... 5 cs.
Coated paper ..... 29 cs.
Marble paper ..... **7 cs.**
Basic paper ..... 11 cs.
Decalcomania paper ..... 38 cs. (duplex)
Decalcomanias ..... 32 cs.
Tissue paper ..... 76 cs.
Card board ..... 23 cs.
Paper tubes ..... 142 cs.
Miscellaneous paper ..... 49 cs.

WALL PAPER

Rohner Gehrig & Co., *Sagoporack,* Gefle, 22 bxs.
———, *American Trader,* London, 5 bls., 2 cs.
———, *Bremen,* Bremen, 8 cs.

PAPER HANGINGS

W. H. S. Lloyd & Co., *American Trader,* London, 21 bls., 6 cs.

NEWSPRINT

H. G. Craig Co., *Kernic,* Donnacona, 294 rolls.
N. Y. Evening Journal, *Markland,* Liverpool, N. S., 589 rolls.
N, Y. Tribune, *Markland,* Liverpool, N. S., 1885 rolls.
World Telegram, *Markland,* Liverpool, N. S., 602 rolls.
Brooklyn Daily Eagle, *Markland,* Liverpool, N. S., 602 rolls.
Parsons & Whittemore, Inc., *Markland,* Liverpool, N. S., 315 rolls.
Newspaper & Magazine Paper Corp., *Vasaholm,* Norrkoping, 1485 rolls.
Gilman Paper Co., *Vasaholm,* Norrkoping, 631 rolls.
Brooklyn Daily Times, *Vasaholm,* Norrkoping, 432 rolls.
———, *Stavangerfjord,* Skien, 387 rolls.
———, *Stavangerfjord,* Oslo, 255 rolls.
Jay Madden Corp., *Deutschland,* Hamburg, 171 rolls.
N. Y. Evening Journal, *Pr. Harding,* Hamburg, 315 rolls.

PRINTING PAPER

L. A. Consmiller, *Bremen,* Bremen, 8 cs.
Senefelder Co., Inc., *Deutschland,* Hamburg, 13 cs.
Coty Processing Co., *Pr. Harding,* Havre, 5 cs.
———, *Pr. Harding,* Hamburg, 107 rolls.

WRAPPING PAPER

Japan Paper Co., *Gerolstein,* Antwerp, 2 cs.
E. Dietzgen & Co., *Deutschland,* Hamburg, 44 cs.
Jay Madden Corp., *Pr. Harding,* Hamburg, 1059 rolls.
M. M. Cohen, *Pr. Harding,* Hamburg, 58 bls., 320 rolls.

PACKING PAPER

A. J. Bullinger, *Black Eagle,* Rotterdam, 20 cs.

DRAWING PAPER

H. Reeve Angel & Co., Inc., *American Trader,* London, 7 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., *American Trader,* London, 12 cs.
H. Reeve Angel & Co., Inc., *Vasaholm,* Gothenburg, 7 cs.

FILTER MASS

A. Giese & Son, *Deutschland,* Hamburg, 1 cs.

FILTER COMPOUND

H. Reifenberg, *Deutschland,* Hamburg, 50 bls.

SURFACE COATED PAPER

Gevaert Co. of America, *H. Jaspar,* Antwerp, 116 cs.
Globe Shipping Co., *Deutschland,* Hamburg, 2 cs.
———, *Deutschland,* Hamburg, 10 cs.

METAL COATED PAPER

E. B. Baehr & Son, *Deutschland,* Hamburg, 5 cs.

COATED PAPER

Gevaert Co. of America, *Black Tern,* Antwerp, 29 cs.

MARBLE PAPER

Borden Riley Paper Co., *Ferolstein,* Antwerp, 7 cs.

BASIC PAPER

Globe Shipping Co., *Deutschland,* Hamburg, 11 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., *American Shipper,* Liverpool, 38 cs. (duplex).

DECALCOMANIAS

L. A. Consmiller, *Bremen,* Bremen, 9 cs.
Sellers Transportation Co., *Bremen,* Bremen, 23 cs.

TISSUE PAPER

Meadows Wye & Co., *Carinthia,* Liverpool, 2 cs.
———, *Roma,* Genoa, 74 cs.

CARD BOARD

Metropolitan Importing & Manfg. Co., *Pr. Harding,* Hamburg, 23 cs.

PAPER TUBES

———, *Deutschland,* Hamburg, 142 cs.

MISCELLANEOUS PAPER

T. N. Fairbanks Co., Inc., *Noto Maru,* Yokohama, 49 cs.

RAGS, BAGGINGS, ETC.

———, *Executive,* Piraeus, 88 bls. rags.
———, *Fernbank,* Algiers, 150 bls. rags.
E. J. Keller Co., Inc., *Black Heron,* ———, 67 bls. rags.
D. Benedetto, Inc., *Black Heron,* Rotterdam, 255 bls. bagging.
———, *Hallbjorg,* Hamburg, 95 bls. rags.
———, *American Trader,* London, 35 bls. paper stock.
———, *American Shipper,* Manchester, 64 bls. waste strings.
Royal Manfg. Co., *American Shipper,* Manchester, 50 bls. picker waste.
———, *American Shipper,* Manchester, 75 bls. rags.
M. Snedeker Corp., *American Shipper,* Belfast, 100 bls. paper stock.
Manufacturers Trust Co., *Banaderos,* London, 52 bls. rags.
Philadelphia National Bank, *Banaderos,* London, 26 bls. rags.
H. Hollander, *Vasaholm,* Gothenburg, 70 bls. rags.
J. Cohen Son Co., Inc., *Carinthia,* Liverpool, 16 bls. rags.
Manufacturers Trust Co., *Carinthia,* Liverpool, 75 bls. rags.
———, *Carinthia,* Liverpool, 45 bls. rags.
Chase National Bank, *Gerolstein,* Antwerp, 75 bls. bagging.
———, *Gerolstein,* Antwerp, 20 bls. rags, 81 bls. cotton waste.
Great Eastern Packing & Paperstock Corp., *Maasdam,* Rotterdam, 205 bls. bagging.
———, *Maasdam,* Rotterdam, 30 bls. bagging.
Royal Manfg. Co., *H. Jaspar,* Antwerp, 23 bls. cotton waste.
S. Shapiro & Son, *Scanstates,* Copenhagen, 4 bls. rags.
Banco Coml Italiane Trust Co., *Scanstates,* Copenhagen, 151 bls. twine waste.
E. J. Keller Co., Inc., *Pr. Harding,* ———, 100 bls. bagging.
E. J. Keller Co., Inc., *Fernbank,* ———, 150 bls. paper stock.

HIDE CUTTINGS

American Express Co., *American Shipper,* Liverpool, 280 bags.
American Express Co., *Carinthia,* Liverpool, 268 bags, 17 bls.

OLD ROPE

Continental Bank Trust Co., *Black Heron,* Rotterdam, 46 coils.
D. Benedetto, Inc., *Cypria,* Marseilles, 56 rolls.
E. J. Keller Co., Inc., *American Trader,* ———, 38 coils.
Chase National Bank, *Montreal City,* Bristol, 168 coils.

CHINA CLAY

Whitaker Clark & Daniels, *Carinthia,* Liverpool, 190 bags.

WOOD PULP

———, *Barbarigo, Trieste,* 794 bls. wood pulp.
———, *Barbarigo, Trieste,* 560 bls. sulphite.
———, *Black Heron,* Rotterdam, 680 bls. wood pulp, 135 tons.
Gottesman & Co., Inc., *Vasaholm,* Gothenburg, 3000 bls. sulphate.
Gottesman & Co., Inc., *Sagoporack,* Gefle, 1500 bls. sulphite, 152 tons.
Pagel Horton & Co., Inc., *Sagoporack,* Gefle, 750 bls. sulphite, 150 tons.
Perkins Goodwin & Co., *Sagoporack,* Sundsvall, 1260 bls. sulphite, 210 tons; 1500 bls. sulphate, 250 tons.
Pagel Horton & Co., Inc., *Sagoporack,* Gefle, 1085 bls. sulphate, 220 tons.
Gottesman & Co., Inc., *Sagoporack,* Sundsvall, 2130 bls. sulphite, 355 tons; 4200 bls. sulphate, 700 tons.
Castle & Overton, Inc., *O. Petersen,* Hamburg, 3080 bls. wood pulp, 616 tons.
Bulkley Dunton Pulp Co., *T. Fagelund,* ———, 12825 bls. wood pulp.
J. Andersen & Co., *T. Fagelund,* Hernosand, 3660 bls. sulphate.
Johaneson Wales & Sparre, *T. Fagelund,* Hernosand, 6243 bls. sulphate, 1650 bls. sulphite.
Johaneson Wales & Sparre, *T. Fagelund,* Sundsvall, 8185 bls. sulphite, 150 bls. sulphate, 200 bls. chemical pulp, 120 bls. knotter pulp.
Mead Sales Co., Inc., *T. Fagelund,* Sundsvall, 210 bls. chemical pulp, 315 bls. sulphite.
Gottesman & Co., Inc., *T. Fagelund,* Sundsvall, 870 bls. sulphite.
Pagel Horton & Co., Inc., *Milos,* Gefle, 5973 bls. wood pulp.
Tradesmans National Bank Trust Co., *Milos,* Gefle, 1750 bls. wood pulp.
Stora Kopparberg Corp., *Milos,* Skutskar, 338 bls. wood pulp.
E. M. Sergeant Pulp & Chemical Co., *Stavangerfjord,* Frederickstad, 450 bls. chemical pulp.
Irving Trust Co., *Stavangerfjord,* Oslo, 660 bls. mechanical pulp.
The Borregaard Co., Inc., *Stavangerfjord,* Sarpsborg, 1008 bls. sulphate.
Price & Pierce, Ltd., *Gypsum Empress,* Windsor, N. S., 600 bls. wood pulp.
Castle & Overton, Inc., *Deutschland,* Hamburg, 2985 bls. wood pulp, 597 tons.
Castle & Overton, Inc., *Scanstates,* Helsingfors, 1525 bls. sulphite, 303 tons.
Lagerloef Trading Co., *Scanstates,* Helsingfors, 786 bls. mechanical pulp, 156 tons; 1892 bls. sulphate, 349 tons; 2705 bls. sulphite, 477 tons.

WOOD PULP BOARDS

H. Fuchs & Son, *Vasaholm,* Gothenburg, 39 crates, 1 cs.
A. Giese & Son, *Maasdam,* Rotterdam, 20 bls.
Jay Madden Corp., *Scanstates,* Helsingfors, 493 pkgs.

NEWARK IMPORTS

WEEK ENDING MAY 22, 1937

Pagel Horton & Co., Inc., *Milos,* Sweden, 6075 bls. wood pulp.

PORTLAND IMPORTS

WEEK ENDING MAY 22, 1937

Pagel Horton & Co., Inc., *Milos,* Sweden, 2500 bls. wood pulp.
Gottesman & Co., Inc., *Milos,* Sweden, 5375 bls. wood pulp.

NEW LONDON IMPORTS

WEEK ENDING MAY 22, 1937

Bulkley Dunton Pulp Co., *T. Fagelund,* ———, 1000 bls. sulphite.
Johaneson Wales & Sparre, Inc., *T. Fagelund,* Hernosand, 900 bls. sulphate, 900 bls. sulphite.

BOSTON IMPORTS

WEEK ENDING MAY 22, 1937

M. Sone, *Barbarigo,* Trieste, 1354 bls. wood pulp.
———, *Black Heron,* Rotterdam, 39 bls. rags.
Brown Bros. Harriman & Co., *Black Heron,* Rotterdam, 81 coils old rope.
T. D. Downing & Co., *Black Heron,* Rotterdam, 45 bls. paper stock.
Ashuelot Paper Co., *Black Heron,* Rotterdam, 75 bls. bagging.
———, *Black Heron,* Antwerp, 26 bls. rags.
———, *Black Heron,* Antwerp, 21 bls. wrapping paper.
F. J. Fawcett, *Black Heron,* Antwerp, 3 bls. flax waste.
Irving Trust Co., *Black Heron,* Antwerp, 81 bls. flax waste.
E. J. Keller Co., Inc., *Black Heron,* ———, 78 bls. bagging.
E. J. Keller Co., Inc., *Noto Maru,* ———, 200 bls. bagging.
E. J. Keller Co., Inc., *Maasdam,* ———, 58 bls. bagging.
Gottesman & Co., Inc., *Rydboholm,* Sweden, 639 bls. wood pulp.
———, *Maasdam,* Rotterdam, 58 rolls straw board.

PHILADELPHIA IMPORTS

WEEK ENDING MAY 22, 1937

———, *City of Glasgow,* Sydney, 29 coils old rope.
Philadelphia Inquirer Co., *Vasaholm,* Norrkoping, 492 rolls newsprint.
Castle & Overton, Inc., *Sagoporack,* Helsingfors, 990 bls. sulphite, 195 tons.
Lagerloef Trading Co., *Sagoporack,* Helsingfors, 570 bls. sulphite, 108 tons; 150 bls. sulphate, 30 tons.
J. M. Hampton Jr. & Co., *Sagoporack,* Helsingfors, 464 rolls newsprint.
Wilkinson Bros. Co., Inc., *Sagoporack,* Helsingfors, 67 rolls newsprint.
Neidich Process Co., *Sagoporack,* Helsingfors, 97 bbls. paper.
Jay Madden Corp., *Sagoporack,* Helsingfors, 167 bls., 534 reels wood pulp boards.
Gottesman & Co., Inc., *Sagoporack,* Gefle, 3000 bls. sulphite, 304 tons.
Gottesman & Co., Inc., *Sagoporack,* Sundsvall, 6000 bls. sulphate, 1000 tons.
Perkins Goodwin & Co., *Sagoporack,* Sundsvall, 1572 bls. sulphate, 262 tons; 1200 bls. sulphite, 200 tons.
Gottesman & Co., Inc., *Sagoporack,* Sundsvall, 600 bls. sulphite, 100 tons.
Pagel Horton & Co., Inc., *Sagoporack,* Gefle, 2250 bls. sulphate, 456 tons; 500 bls. sulphite, 100 tons.
———, *Lionel,* Port Alfred, Quebec, 1314 rolls newsprint.
———, *Maasdam,* Rotterdam, 56 cs. parchment paper.
R. Blank, *Black Eagle,* Rotterdam, 100 bls. rags.
E. J. Keller Co., Inc., *Black Eagle,* ———, 46 bls. rags.
W. F. Sherwood & Son, *Black Eagle,* Antwerp, 209 bls. rags.
M. Sone, *Rydboholm,* Gothenburg, 4064 bls. wood pulp.
M. Sone, *Livenza,* Trieste, 1000 bls. wood pulp.
E. J. Keller Co., Inc., *Bretagne,* ———, 105 bls. paper stock.

WILMINGTON IMPORTS

WEEK ENDING MAY 22, 1937

Lagerloef Trading Co., *Scanstates,* Helsingfors, 894 rolls wood pulp boards; 4848 bls. sulphite, 961 tons.
Castle & Overton, Inc., *Scanstates,* Helsingfors, 5008 bls. sulphite 1001 tons.
Jay Madden Corp., *Scanstates,* Helsingfors, 133 rolls newsprint.

BALTIMORE IMPORTS

WEEK ENDING MAY 22, 1937

Perkins Goodwin & Co., *Vasaholm,* Norrkoping, 1750 bls. sulphate.
Gottesman & Co., Inc., *Vasaholm,* Gothenburg, 1800 bls. sulphate.
Jay Madden Corp., *Vasaholm,* Kotka, 1666 rolls newsprint.
F. H. Shallus Co., *Vasaholm,* Kotka, 140 rolls newsprint.
Wilkinson Bros. & Co., Inc., *Vasaholm,* Kotka, 150 rolls newsprint.
Hearst Consolidated Publications, Inc., *Vasaholm,* Kotka, 632 rolls newsprint.
———, *Lionel,* Port Alfred, Quebec, 2392 rolls newsprint.
Castle & Overton, Inc., *Black Tern,* Rotterdam, 325 bls. wood pulp, 65 tons.
———, *Black Tern,* Rotterdam, 500 bls. wood pulp, 98 tons.
Congoleum Nairn Co., *Black Tern,* Antwerp, 233 bls. rags.
Gottesman & Co., Inc., *Tampa,* Sweden, 600 bls. wood pulp.

(Concluded on page 52)

OUR CLAYS ARE NATURAL, THEREFORE FAST COLOR

NOT ARTIFICIALLY BLUED OR BLEACHED

Superior Quality and Service Obtains Business

ENGLISH ECCO CLAYS **CLAYS**

English China Clays Sales Corporation

551 Fifth Avenue New York City

EXCELSIOR FELTS

a product of

THE KNOX WOOLEN CO.

CAMDEN MAINE

DISTRIBUTED SINCE 1864 BY

BULKLEY, DUNTON & CO.

295 MADISON AVE. NEW YORK, N. Y.

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100 YEARS AGO

A century ago the first Simonds - Worden - White product was offered for sale. Today the S.W.W. line enjoys a world-wide reputation. • Mill men, investigate S.W.W. standard and special patterned bed plates and beater bars. • Also paper trimming and chipper knives and Dayton abrasive wheels.

SIMONDS WORDEN WHITE CO.

OFFICE DAYTON, OHIO

Factories at DAYTON - BUFFALO - CLEVELAND - BELOIT

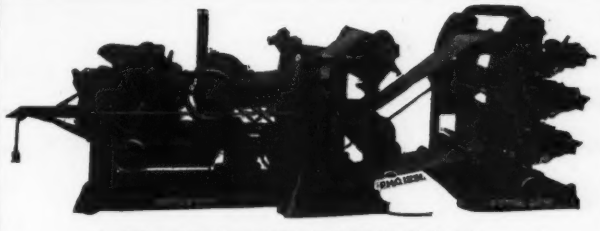
INSURE MINIMUM PRODUCTION COSTS

BREAK-DOWN, imperfect bags, and general waste of both time and material are common occurrences in bag factories. Insure yourself against these unnecessary "profit eaters" by installing POTDEVIN paper bag equipment. You will find that POTDEVIN machines produce bags at the fastest speeds, operating with the highest degree of efficiency at the lowest cost.

POTDEVIN MACHINE CO.

1223 38th Street, Brooklyn, N. Y.

ESTABLISHED 1893 TEL. WIndsor 6-1700



POTDEVIN

MODEL 102—HIGH SPEED

NOTION BAG MACHINE

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, May 26, 1937.

Demand for the various grades of paper fell off slightly during the past week. The contract movement, however, is well up to average. Sales forces of the leading paper organizations continue optimistic. Prices are holding to formerly quoted levels without difficulty.

The position of the newsprint industry continues to improve. Manufacturing operations in the United States, Canada and Newfoundland are being maintained at practically full time levels to take care of current orders for consumption. Observers of this market express the utmost confidence in its future.

The fine paper market continues quite buoyant. Demand for book, cover, bond and ledger papers is holding up well. Prices are steady to firm. Tissues are moving in good volume. The coarse paper market is strong with kraft specialties moving into consumption freely.

Mechanical Pulp

The ground wood pulp market continues steady. Production in the United States, Canada and abroad are keyed to consumption as far as possible in order to meet current requirements. Contract shipments are moving in satisfactory volume.

Chemical Pulp

Steadiness prevails in the chemical pulp market and in some instances prices are still rising. Prime bleached sulphite is now quoted at from $3.25 to $4.65, while No. 1 kraft pulp is offered at from $2.60 to $3.50. Bleached kraft pulp is holding up well.

Old Rope and Bagging

Paper mill demand for old rope is fairly steady. Domestic and imported old manila rope is moving in better volume. Small mixed rope is in fair request. The bagging market is only fairly active. Gunny and scrap bagging are in moderate request.

Rags

No radical changes are being recorded in the domestic rag market. Demand for new and old cotton rags is moderately active, and there is some export interest developing in new cotton cuttings. Roofing grades are in moderate request. The imported rag market is fairly steady.

Waste Paper

The paper stock market is somewhat quieter at present, while demand for the higher grades from the paper mills is well sustained, especially for hard and soft white shavings and envelope cuttings. Demand for the lower grades from the board mills has fallen off slightly.

Talc

There has been no further change in the talc market. Demand for the various varieties is generally well sustained. The contract movement is normal. Prices are generally holding to schedule and quotations are well maintained.

CONGRESSIONAL COMMITTEE MAKES AWARDS

(Continued from page 26)

No. 276, Barton, Duer & Koch Paper Company, 7.00 cents.
No. 277, Barton, Duer & Koch Paper Company, 7.75 cents.
No. 281, no bids received.
No. 203, Stanford Paper Company, $22.50 per M sheets.
No. 303, Barton, Duer & Koch Paper Company, $34.65 per M sheets.
No. 304, Barton, Duer & Koch Paper Company, $45.70 per M sheets.
No. 305, Barton, Duer & Koch Paper Company, $29.95 per M sheets.
No. 306, Barton, Duer & Koch Paper Company, 4.65 cents.
No. 307, Barton, Duer & Koch Paper Company, 4.65 cents.
No. 308, Barton, Duer & Koch Paper Company, 4.65 cents.
No. 309, Barton, Duer & Koch Paper Company, 4.65 cents.
No. 310, Barton, Duer & Koch Paper Company, 4.65 cents.
No. 351, Whitaker Paper Company, $6.64 per 100 sheets.
No. 352, Walker, Goulard, Plehn Company, $20.31 per 100 sheets.
No. 360, Stanford Paper Company, 2.45 cents.
No. 361, Whitaker Paper Company, 2.1478 cents.
No. 363, no bids received.
No. 364, Stanford Paper Company, 3.038 cents.
No. 365, Barton, Duer & Koch Paper Company, 2.63 cents.
No. 366, Mathers-Lamm Paper Company, 3.57 cents.
No. 367, Mathers-Lamm Paper Company, 3.57 cents.
No. 368, no bids received.

IMPORTS OF PAPER AND PAPER STOCK

(Continued from page 50)

Price & Pierce, Ltd., *Tampa,* Sweden, 1500 bls. unbleached sulphite.
Parsons & Whittemore, Inc., *Tampa,* Sweden, 270 bls. wood pulp.
Parsons & Whittemore, Inc., *City of Havre,* ——, 333 bls. wood pulp.
M. Sone, *City of Newport News,* Hamburg, 497 bls. wood pulp.

J. Andersen & Co.

Selling Agents

21 East 40th Street

New York

CHEMICAL & MECHANICAL PULP

Kraft Pulp

BERGVIK OCH ALA NYA AKTIEBOLAG
Söderhamn, Sweden
KALIX TRÄINDUSTRI AKTIEBOLAG
Vanaförden, Sweden
MUNKSUNDS AKTIEBOLAG
Munksund, Sweden
NENSJÖ CELLULOSA A.-B.
Sprängsviken, Sweden

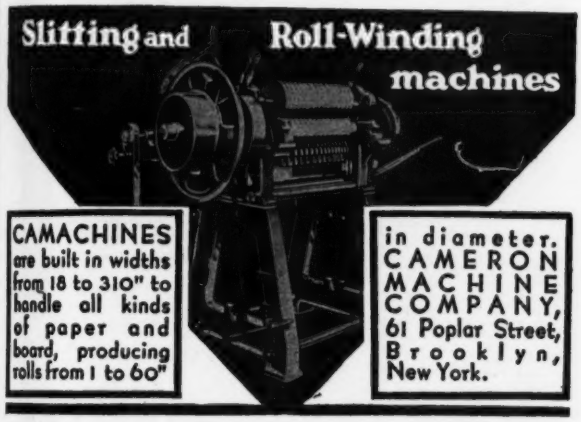
Bleached Sulphite

KELLNER-PARTINGTON PAPER PULP CO., LTD.
Sarpsborg, Norway
Edsvalla, Sweden
Hallein & Villach, Austria

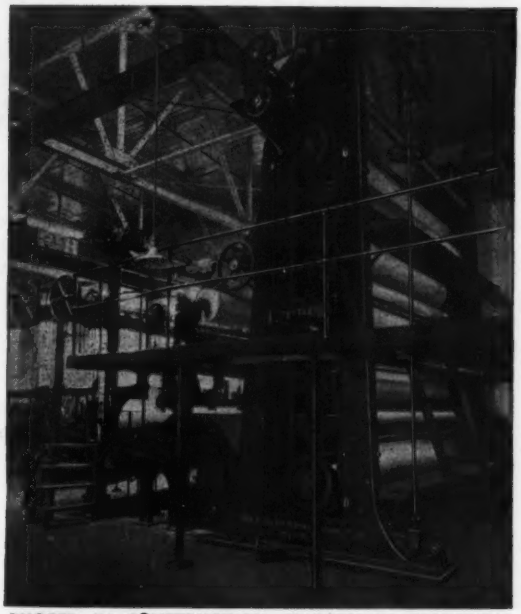
Unbleached Sulphite

AKTIESELSKABET GREAKER CELLULOSEFABRIK
Greaker, Norway
BERGVIK OCH ALA NYA AKTIEBOLAG
Söderhamn, Sweden
CELLULOSEFABRIKS A.-G.
Bratislava, Czecho-Slovakia
SYANÖ AKTIEBOLAG
Svanö, Sweden

Slitting and Roll-Winding machines



CAMACHINES are built in widths from 18 to 310" to handle all kinds of paper and board, producing rolls from 1 to 60" in diameter. CAMERON MACHINE COMPANY, 61 Poplar Street, Brooklyn, New York.



RUGGED IN CONSTRUCTION—SMOOTH IN OPERATION

The 9 Roll Super Calender installation shown above is a precedent of the Advanced Design of Textile's Paper Finishing Machinery.

The Textile Finishing Machinery Co.

New York Office
50 Church St.

Southern Office
Johnston Bldg., Charlotte, N. C.

Providence, R. I.

An S&W JORDAN *for FINE PAPER MILLS*

S & W Jordans come in 4 standard sizes. Capacities are from 3 to 45 T of paper stock per 24 hours depending on the size and grade of paper. A steel cap does away with need of shrunk-on bands and may be used for several sets of filling. Initial cost and upkeep on these Jordans are extremely low. Bulletin sent on request.

The SMITH & WINCHESTER MFG. Co.
SOUTH WINDHAM, CONNECTICUT
Holders of the Original Jordan Patents

3924

mineral pigments

C. K. WILLIAMS & CO. EASTON, PA. DRY COLORS FILLERS

NATURAL AND SYNTHETIC

FOR PERMANENT COLORS
Brown, Red and Yellow
Iron Oxides
Green Oxides of Chromium

C. K. WILLIAMS & COMPANY
EASTON·PENNSYLVANIA

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, May 26, 1937.

BLANC FIXE—The blanc fixe market continues steady. Prices are holding to formerly quoted levels. The pulp is offered at from $42.50 to $45 per ton, in bulk; while the powder is selling at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—Trading in the bleaching powder market is light. The contract movement is seasonal and prices are generally maintained at formerly quoted levels. Bleaching powder is offered at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The casein market is somewhat easier. Domestic standard ground casein is quoted at from 13½ to 14 cents per pound; while domestic finely ground casein is selling at from 14 to 14½ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA—Conditions in the caustic soda market are satisfactory. The contract movement is normal. Solid caustic soda is quoted at from $2.55 to $2.60; while the flake and ground are selling from $2.85 to $3 per 100 pounds, in drums, at works.

CHINA CLAY—The china clay market is exhibiting a strong undertone. Contract shipments are moving freely. Imported china clay is quoted at from $15 to $21 per ton, ship side; while domestic paper making clay is selling at from $6.50 to $12 per ton, at works.

CHLORINE—While business in the chlorine market is holding up well, the contract movement is normal for the season. Prices are holding up to formerly quoted levels. Chlorine is selling at from $2.15 to $2.25 per 100 pounds, in tank cars, at works.

ROSIN—The rosin market is little changed. Paper making gum rosin is now quoted at $8.30 and wood rosin at $8.50 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent rosin size is selling at $3.70 per 100 pounds in tank cars, at works.

SALT CAKE—Paper mill demand for salt cake is excellent. Prices are steady and unchanged. Salt cake is quoted at from $12 to $13; chrome salt cake at from $11 to $12 per ton, at works; while imported salt cake is selling at from $12 to $13 per ton, ship side.

SODA ASH—The soda ash market is fairly active. Paper mill demand is insistent. Prices are holding to formerly quoted levels. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.05; in bags, $1.20; and in barrels, $1.50.

STARCH—Demand for starch is fairly persistent. The contract movement is normal. Prices are steady and unchanged. Special paper making starch is quoted at $4 per 100 pounds, in bags; and at $4.27 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA—The sulphate of alumina market is better. Contract shipments are moving in good volume. Commercial grades are quoted at from $1.25 to $1.60; while iron free is selling at from $2 to $2.25 per 100 pounds, in barrels, at works.

SULPHUR—The sulphur market is steady. Yearly contracts are quoted at $18 per long ton on orders of 1,000 tons, or over and $20 on smaller quantities. On spot and nearby car loads the quotations is $21 per ton. All quotations are in car lots, at works.

TALC—Offerings of talc are moderately active. In most instances prices are holding to schedule. Domestic talc is still quoted at from $15 to $18 per ton, at eastern mines; while imported talc is selling at from $23 to $30 per ton, on dock.

Market Quotations

Paper

Tissues—Per Ream—

White No. 1	.95	@	—
White No. 1 M. G.	.92½	@	—
White No. 1½	.67½	@	—
White No. 2	.62½	@	—
Anti-Tarnish M. G.	.75	@	—
Colored	.87½	@	—
Kraft	.75	@	—
Manila	.62½	@	—
Unbleached Toilet.	2.60	@	3.30
Bleached Toilet	3.94	@	5.26

Paper Towels—

Unbleached	2.10	@	3.35
Bleached	3.30	@	3.70

Manila—

No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00

Fibre Papers—

No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75

(Delivered New York)

News, per ton—

Roll, contract	42.50	@	—
Sheets	47.50	@	—

Kraft—

No. 1 Northern	5.25	@	5.75
Standard	5.00	@	—
Southern	5.00	@	—
Glazed	4.50	@	—
Striped	4.75	@	—

Boards, per ton—

News	47.50 @50.00
Chip	45.00 @47.50
Sgl. Mla. Ll. Chip.	55.00 @60.00
Jute Lined Chip	55.00 @60.00
Kraft Liners	65.00 @67.50
White Pat. Coated	67.50 @70.00
Binders Boards	70.00 @75.00

The following are distributors' resale prices:—

Rag Content Bonds and Ledgers—

16-Carton Quantities, White, Assorted Items

Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$43.20	$44.40
100% Rag	34.20	35.40
85% Rag	—	33.60
75% Rag	25.80	27.00
65% Rag	23.15	24.40
50% Rag	20.00	21.25
25% Rag	16.90	18.15

Regular colors @ $1.50 cwt. extra.
Heavy Colors @ $3.00 cwt. extra.

Sulphite Bonds and Ledgers—

16-Carton Quantities, White, Assorted Items

Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.00	$11.25
No. 2	9.05	10.30
No. 4	8.15	9.40

Regular Colors @ $1.50 cwt. extra.
Heavy Colors @ $3.00 cwt. extra.

Free Sheet Book Papers—

4-Case Quantities, White, Case Assortment

Delivered in Zone 1:

No. 1 Glossy Coated	$13.65
No. 2 Glossy Coated	11.90
No. 3 Glossy Coated	10.65
No. 1 Antique (watermarked)	10.00
No. 2 Offset	9.25
A Grade E. F.	9.05
A Grade Super	9.30
B Grade E. F.	8.45
B Grade Super	8.70
C Grade E. F.	8.15
C Grade Super	8.40
D Grade E. F.	7.80
D Grade Super	8.05

Ivory & India @ $.50 cwt. extra.

Add 60 cents per short ton, dock charges, for Albany; $2.00 for Lake Ports East and $3.00 for Lake Ports West of Mackinac Straits.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—

Moist	33.00	@36.00
Dry	40.00	@42.00

(Delivered)

No. 1 Domestic and Canadian	33.00	@36.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—

Prime Bleached Sulphite	3.25	@	4.65

Prime Qualities—

Easy-Bleaching Sulphite	3.50	@	3.75
Strong Unbleached Sulphite	3.40	@	3.65

(On Dock, Atlantic Ports)

Kraft Bleached	3.50	@	4.50
Kraft Light & Strong	2.75	@	3.75
Kraft No. 1	2.60	@	3.50
Kraft No. 2	2.50	@	2.75

(F.o.b. Pulp Mill)

Kraft Domestic	2.50	@	3.25

(Delivered)

Soda Bleached	2.90	@	—

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	9.00	@	9.25
Silesias, No. 1	6.75	@	7.00
New Unbleached	9.25	@	9.50
Blue Overall	7.50	@	8.00
Fancy	4.00	@	4.50
Washables	3.00	@	3.50
Mixed Khaki Cuttings	4.25	@	4.50
O. D. Khaki Cuttings	4.75	@	5.00

Old Rags

White, No. 1—			
Repacked	3.50	@	3.75
Miscellaneous	3.00	@	3.25
White, No. 2—			
Repacked	2.50	@	2.75
Miscellaneous	2.00	@	2.25
Thirds and Blues—			
Repacked	2.00	@	2.25
Miscellaneous	1.90	@	2.00

Roofing Rags—

No. 1	Nominal	
No. 2	1.35	1.45
No. 3 (bagging)	1.20	@ 1.30
No. 4	1.20	@ 1.30
No. 5A	1.05	@ 1.10

Foreign Rags

New Rags

New Dark Cuttings	2.25	@	2.50
New Mixed Cuttings	2.00	@	2.25
New Light Silesias	5.50	@	5.75
Light Flannelettes	5.50	@	5.75
New White Cuttings	7.00	@	7.50
New Light Oxfords	4.00	@	4.50
New Light Prints	3.00	@	3.25

Old Rags

No. 1 White Linens	7.50	@	8.00
No. 2 White Linens	6.50	@	7.00
No. 3 White Linens	4.50	@	5.00

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No. 4 White Linens.	2.25	@	2.50
No. 1 White Cotton.	4.25	@	4.75
No. 2 White Cotton.	3.25	@	3.75
No. 3 White Cotton.	2.50	@	2.75
No. 4 White Cotton.	1.90	@	2.15
Extra Light Prints..	2.00	@	2.25
Ord. Light Prints...	1.75	@	1.85
Med. Light Prints..	1.55	@	1.65
Dutch Blue Cottons..	2.25	@	2.50
French Blue Linens..	3.50	@	4.00
German Blue Linens.	2.50	@	2.75
German Blue Cottons	2.00	@	2.25
Checks and Blues...	2.00	@	2.25
Linsey Garments....	2.25	@	2.35
Dark Cottons.....	2.15	@	2.25
Old Shopperies.....	1.75	@	2.00
New Shopperies.....	1.75	@	2.00
French Blues.....	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.25	@	2.35
Domestic	2.15	@	2.25
Wool Tares, light....	1.75	@	1.85
Wool Tares, heavy...	2.20	@	2.35
Bright Bagging.....	1.70	@	1.75
Manila Rope—			
Foreign	5.00	@	5.25
Domestic	5.25	@	5.50
Jute Strings.....	2.75	@	3.00
Sisal Strings.....	2.60	@	2.75
Mixed Strings.....	Nominal		

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	3.25	@	3.50
Ordinary Hard White No. 1....	2.60	@	2.70
Hard White No. 2.	2.50	@	2.60
Soft White No. 1..	2.40	@	2.50
Flat Stock—			
Stitchless	1.45	@	1.55
Overissue Mag....	1.45	@	1.55
Solid Flat Book....	1.40	@	1.45
Crumbled No. 1....	1.20	@	1.25
Ledger Stock.....	1.30	@	1.35
New B. B. Chips....	.65	@	.70
Manila—			
New Env. Cut.....	2.25	@	2.35
New Cuttings.....	1.90	@	2.10
Old Kraft Machine—			
Compressed bales..	1.80	@	1.90
News—			
No. 1 White News	1.50	@	1.60
Strictly Overissue..	.90	@	1.00
Strictly Folded....	.70	@	.75
No. 1 Mixed Paper..	.65	@	.70

Twines

(F. o. b. Mill)

(Soft Fibre)			
Coarse Polished—			
India	.16	@	.18½
Belg. White Hemp	.17	@	.20½
India Compress....	.16½	@	.17
Fine Polished—			
Fine India.....	.22	@	.24
Unpolished—			
Box	.11¼	@	.12¼
Paper Makers.....	.11½	@	.13¼
Tube Rope.....	.12½	@	.15¼
Wall Paper.....	.13½	@	.14¼
Wrapping	.17	@	.21
Soft Fiber Rope...	.14¾	@	.15¼
(Hard Fibre)			
Bond	.13½	@	.22
Anchor	.13	@	.14½
Manila	.21	@	.28

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.08	@	.08½
New White, No. 2.	.04½	@	.05
Light Silesias.....	.05½	@	—
Silesias, No. 1....	.04½	@	.05
Black Silesias, soft.	.03½	@	.04
New Unbleached...	.06	@	—
Washable, No. 1..	.02	@	.02½
Blue Overall.....	.07	@	.07½
Cottons—According to grades—			
Washable, No. 2..	.02½	@	.04½
New Blue.....	.02	@	.02½
Fancy	.03	@	—
New Black Soft...	.04	@	.04½
New Light Seconds	.03½	@	.04
New Dark Seconds	2.00	@	2.25
Khaki Cuttings—			
No. 1 O. D.....	.04	@	.04½
No. 2 Mixed.....	.03½	@	.04
Corduroy	.02	@	.02¼
New Canvas.....	.04	@	.04½
New Black Mixed.	.02	@	.02¼

Domestic Rags (Old)

White No. 1—			
Repacked	4.00	@	4.50
Miscellaneous	3.00	@	3.50
Thirds and Blues—			
Miscellaneous	2.00	@	2.25
Repacked	2.50	@	2.75
Black Stockings (Export)	4.50	@	5.00
Roofing Stock—			
Foreign No. 1.....	2.20	@	2.25
Domestic No. 1...	2.00	@	2.10
Domestic No. 2...	1.90	@	2.00
Roofing Bagging..	1.75	@	—

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	2.00	@	—
Domestic	2.25	@	—
Manila Rope.....	4.50	@	—
Sisal Rope.....	3.00	@	—
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1.....	2.25	@	2.50
No. 2.....	1.00	@	1.10
Wool Tares, heavy..	3.25	@	3.50
Mixed Strings.....	1.00	@	1.10
No. 1 New Light Burlap	3.00	@	3.50
New Burlap Cuttings	2.50	@	2.75

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White.	—	@	2.60
No. 2 Hard White.	2.20	@	2.25
No. 1 Soft White..	2.00	@	2.10
No. 2 Soft White..	1.75	@	—
No. 1 Mixed.....	—	@	.85
Solid Ledger Stock..	—	@	1.75
Ledger Stock, white.	1.75	@	—
Ledger Stock, colored	1.50	@	—
No. 1 Books, heavy..	1.20	@	1.25
Manila Cuttings.....	1.80	@	1.90
Print Manila.....	.75	@	.85
Container Manila....	.80	@	—
Kraft Paper.....	1.75	@	—
No. 1 Mixed Paper..	.60	@	.65
Straw Board Chip..	.50	@	—
Binders Board Chip.	.50	@	—
Corrugated Board....	.70	@	.80
Overissue News.....	.75	@	.80
Old Newspapers.....	.60	@	.65

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White.	2.20	@	2.35
No. 1 Soft White..	1.85	@	2.15
No. 2 Mixed.....	.75	@	.80
Solid Ledger Books..	1.50	@	1.75
Overissue Ledger Stock	1.30	@	1.50
Mixed Ldgers.....	.85	@	.90
No. 1 Books, heavy..	1.40	@	—
No. 1 Books, light..	.65	@	.75
Crumpled Stitchless Book Stock.....	.50	@	.60
Manila Env. Cuttings	1.60	@	1.70
Manila Env. Cuttings, extra quality.....	2.20	@	2.30
No. 1 Old Manila...	.95	@	1.00
White Blank News..	1.30	@	1.40
No. 1 Kraft.....	1.90	@	2.00
Mixed Papers.....	.60	@	.65
Print Manila.....	.75	@	.85
Container Manilas...	.27½	@	—
Old Newspapers.....	.60	@	.65
Overissue News.....	.50	@	.65
Box Board Chips....	.55	@	.60
Corrugated Boxes....	.85	@	.90
Kraft corrugated boxes	1.60	@	1.65
Screening Wrappers..	.60	@	.65

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	4.75	@	5.00
Domestic	5.00	@	5.30
Transmission Rope...	2.00	@	2.25
Jute Rope.....	2.50	@	2.75
Soft Jute Strings....	2.75	@	3.00
Jute Carpet Threads.	1.75	@	2.00
Gunny No. 1—			
Foreign	2.50	@	2.60
Domestic	2.10	@	2.15
Bleachery Burlap....	4.25	@	4.50
Scrap Burlap—			
Foreign	2.15	@	2.25
Domestic	1.90	@	2.10
Scrap Sisal.....	2.60	@	2.75
Scrap Sisal for Shredding	2.75	@	3.00
Wool Tares, heavy...	2.40	@	2.60
New Burlap Cuttings	2.85	@	3.00
Aust. Wool Pouches.	3.25	@	3.30
Heavy Baling Bagging	2.40	@	2.60
Paper Mill Bagging..	1.75	@	1.80
Bagging No. 2.....	1.70	@	—

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	.04	@	.04¼
New White No. 1.	.09	@	.09¼
New White No. 2.	.06¼	@	.07
New Light Flannelettes	.07½	@	—
Silesias No. 1.....	.07¾	@	.08
New Black Silesias	.04¼	@	.04½
Soft Unbleached...	.09½	@	.09¾
Blue Cheviot.....	.07½	@	.07¾
Fancy	.03¾	@	.04
Washable	.03	@	.03¼
Kraft, M. F.....	6.00	@	—
Cottons—According to grades—			
Blue Overalls.....	.07½	@	.07¾
New Black, soft.....	.04¼	@	.04½
Khaki Cuttings.....	.04¾	@	.05
O. D. Khaki.....	.05	@	.05¼
Corduroy	.03¼	@	.03½
New Canvas.....	.07¾	@	.08¼
B.V.D. Cuttings.....	.08¾	@	.09

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues.....	1.75	@	2.00
Third and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62¼
Black Stockings.....	3.90	@	4.00
Roofing Stock—			
No. 1.....	1.35	@	1.45
No. 2.....	1.35	@	1.40
No. 3.....	1.05	@	1.15

Foreign Rags

(F. o. b. Boston)

Dark Cottons.....	1.90	@	2.00
Dutch Blues.....	3.00	@	3.15
New Checks and Blues	2.85	@	3.00
Old Fustians.....	2.85	@	3.00
Old Linsey Garments	2.50	@	2.65
New Silesias.....	6.50	@	7.00

CHICAGO

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings....	3.30	@	3.40
No. 1 Hard White.	2.60	@	2.70
No. 1 Soft White..	2.10	@	2.25
Ledger & Writings..	1.40	@	1.50
Solid Books.....	1.25	@	1.30
Blanks	1.50	@	1.65
Krafts	1.00	@	1.25
New Kraft Cuts....	1.80	@	2.00
Manila Env. Cuts...	2.20	@	2.35
Ex. No. 1 Manila...	2.20	@	2.35
Print Manila.....	1.70	@	1.80
Overissue News.....	.80	@	.90
Old Newspapers—			
No. 1 Folded News	.80	@	.90
No. 1 Mixed Paper	.80	@	.90
Roofing Stocks—			
No. 1.....	2.00	@	2.25
No. 2.....	1.85	@	2.00

TORONTO

Paper

Bonds and Ledgers

Delivered

No. 1 White	.35½	@	—
No. 1 Tints	.36½	@	—
No. 2 White	.26½	@	—
No. 2 Tints	.27½	@	—
No. 4 White	.15	@	—
No. 4 Tints	.16	@	—
No. 5 Bond—White .	.11	@	—
No. 5 Bond—Tints .	.12	@	—
No. 5 Bond—Golden Rod	.13	@	—
No. 5 Ledger—White	.11½	@	—
No. 5 Ledger—Tints.	.12	@	—
No. 6 Bond—White .	.10½	@	—
No. 6 Bond—Tints .	.11	@	—
No. 6 Bond—Golden Rod	.12½	@	—
No. 7 Bond—White .	.08¾	@	—
No. 7 Bond—Tints .	.09¼	@	—
No. 7 Bond—Golden Rod	.10¾	@	—
Book—			
No. 1 M. F.....	6.75	@	7.00
No. 2 M. F.....	6.50	@	6.75
No. 3 M. F.....	5.25	@	5.75
No. 1 S. C.....	7.25	@	7.50
No. 2 S. C.....	6.75	@	7.00
No. 3 S. C.....	5.75	@	6.00
No. 1 Coated and Litho 12.00		@	—
No. 2 Coated and Litho 10.50		@	—
No. 3 Coated and Litho	9.50	@	—
Coated tinted.....13.00		@	—
Wrapping—delivered—			
Rag Brown.....	4.85	@	—
White Wrap.....	4.00	@	—
"B" Manila.....	4.90	@	—
No. 1 Manila.....	5.50	@	—
Fiber	5.50	@	—
Kraft, No. 2.....	5.50	@	—

(F. o. b. Cars, Toronto)

News, per ton—			
Rolls (contract)...38.50		@	—
Sheets	45.50	@	—

Pulp

Ground wood.....30.00		@	31.00
Unbleached Sulphite	52.00	@	53.00
Book (Class 1).....	65.00	@	66.00
Writing (Class 2)...	66.00	@	67.00
Select (Class 3).....	67.00	@	68.00

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut...	2.50	@	—
Soft White.....	2.15	@	—
White Blk. News..	1.25	@	1.40
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.00	@	—
Light and Crumpled Book Stock.	1.15	@	—
Ledgers and Writings	1.20	@	—
Manilas—			
New Manila Cut...	1.50	@	—
Printed Manilas...	.55	@	—
Kraft	1.00	@	1.60
News and Scrap—			
Strictly Overissue..	.75	@	—
Strictly Folded....	.80	@	—
No. 1 Mixed Paper..	.65	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.09	@	.09¼
Fancy Shirt Cuttings	.03¼	@	.04